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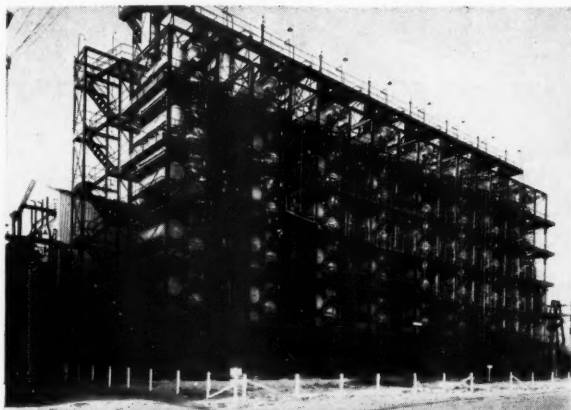
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In this issue . . .

Farm Chemicals Outlook is the new heading for our regular last-minute report from Washington by Fred Bailey and Don Lerch. We feel that the new title will reflect the contents of the column more accurately than its original name, Trends and Forecasts. Accurate, authoritative and timely, the report is brought to you each month with the hope that it will help you plan for the future.

Birth pangs may not actually be involved in bringing a new pest-control chemical to the market, but the long, painstaking efforts that are necessary must make many a pesticide manufacturer think they are. After he has discovered the pesticidal value of a material, figured out a way to produce and market it economically, the manufacturer is really just beginning. There are many hurdles yet to be cleared. One of these is registration under the Federal Insecticide, Fungicide, and Rodenticide Act if the substance is to be sold in interstate commerce. A description of what the manufacturer must do to meet the requirements of the Act is given in this issue, beginning on page 11.

Phosphorus is one of the most vital minerals in the welfare of mankind. Its discovery as an important plant food and its subsequent employment in fertilizers is a fascinating story, ably told by Dr. Vincent Sauchelli in an article on the subject which starts on page 14.

Dust control is a problem in many industrial operations, but in pesticide manufacturing plants it is an absolute must. There are many good systems available from which to choose, and the one you choose will depend in large measure upon your particular problems. How one manufacturer, the Long Island Produce and Fertilizer Company, solved their dust control problem is told in the story that begins on page 20.

Pesticides are on trial—whether or not the industry and the nation's farmers like it. The "trial" is mainly in the form of so-called "investigations" which recently have turned into bids for publicity. Like all such "trials" they don't always make sense, and in the concluding installment of our series on the Delaney Hearings on page 23 you will see what we mean. DDT is still the big bugaboo by which all pesticides are judged, and the resultant confusion is evident in the verbatim records of the hearings. If, in the future, something concrete comes out of the years-long investigation, we will report it as fully as space allows. Meanwhile, pest-control chemicals will continue to be a vital factor in the high production record of the American farmer and the high nutritional standards of the American people.

Reader Service Cards are now a regular feature of this magazine and we hope you will continue to make the most advantageous use possible of this opportunity to get accurate information on the equipment and supplies you plan to purchase for your farm chemicals plant.

AUGUST, 1951

Farm Chemicals

Formerly
American Fertilizer & Allied Chemicals

Established 1894

PIONEER JOURNAL OF THE FARM CHEMICALS INDUSTRY

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AUGUST, 1951

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Cover Story

Phosphate rock, when finely ground and acidulated, provides a readily available source of phosphorus for growing plants. The history of phosphorus as a fertilizer is reviewed by Dr. Vincent Sauchelli in one of our feature articles this month. One of the recent advances in fertilizer technology has been the incorporation of superphosphate in pelletized, complete fertilizers and several factories are now under construction for their increased production.—*Photo courtesy Davison Chemical Company.*

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FARM CHEMICALS

A Resolution for NAC

During their meeting the first week in September, members of the National Agricultural Chemicals Association might well ponder the question, "What, exactly, are the Chairman and the Chief Counsel of the Delaney Committee up to?" They will not have to look far for an answer. The report on the latest phase of the long, costly investigation is due to come off the press at about the same time as the NAC meeting takes place.

An examination of the report will show that the question as to the objectives of the Chairman and the Chief Counsel is most pertinent. Throughout the hearings, the committee's counsel has extended preferential treatment to the various witnesses. When questioning such witnesses as J. I. Rodale (who recently proposed an earthworm brew as a cure for paralysis) and Louis Bromfield, the novelist, Mr. Kleinfeld's questions and statements prefacing his questions were almost tender.

Following the appearance of Bromfield, for example, the committee sent out a "news" release to express their elation over the statements made by the Pulitzer prize winning novelist. "Delaney's committee," said the release in part, "was obviously pleased to hear the practical views of the farmer-writer, as a contrast to the highly technical statements given by a succession of chemists, entomologists and other scientific experts." Probably never before in the history of legislative investigation have the investigators of a technical subject objected to the technical nature of statements made by recognized experts on that subject. For an example of the manner in which Mr. Kleinfeld handles such experts, see "Part III, Delaney Debate," in this issue.

In the same news release mentioned above, the committee observed modestly that "even though the committee has continued its investigation quietly and without scare headlines, letters continue to pour in . . ." No longer can the committee claim "quiet investigation without scare headlines." The committee's chairman, Representative James J. Delaney

(D., N. Y.), has taken care of that. His recent article in the American magazine, "Peril On Your Food Shelf," removed from the Chairman's head the crown he placed there for seeking anonymity. The article also showed that the chairman was willing to make conclusions before his group had stopped taking testimony.

Although Mr. Delaney had made up his mind, the committee still continued to hear witnesses after the publication of his article. Clearly, evidence gathered after conclusions have been drawn can play no part in the drawing of those conclusions, and the compilation of such evidence is, therefore, a waste of taxpayers' money. Just how long ago Mr. Delaney made up his mind that the public is being poisoned by farm chemicals is anybody's guess.

The line of questioning followed by the committee's chief counsel and the prejudicial nature of the Chairman's press releases indicate that the Select Committee to Investigate the Use of Chemicals in Food Products has two distinct needs: (1) a new chief counsel, and (2) a new Chairman.

The matters under investigation by the committee are of primary importance and if new legislation is needed, now or in the future, it must be wise and just. No such legislation is likely to be proposed by the present committee, in spite of the presence of the able men who serve on the committee under Representative Delaney.

For that reason, the National Agricultural Chemical Association might well consider a resolution calling for the replacement of Vincent A. Kleinfeld, as Chief Counsel, and Representative James J. Delaney, as Chairman of the Select Committee to Investigate the Use of Chemicals in Food Products.

If successful, the resolution would perform a great service, not only to the manufacturers of farm chemicals, but to the public which increasingly depends on modern agricultural methods for more and more food. If unsuccessful, the resolution would at least place the Association on record as opposed to the current trend toward what has been called "government by investigation" in which the investigators set themselves up as judge and jury at a trial that is not a trial at all, but merely an inquiry.

— A. M. BRODINE

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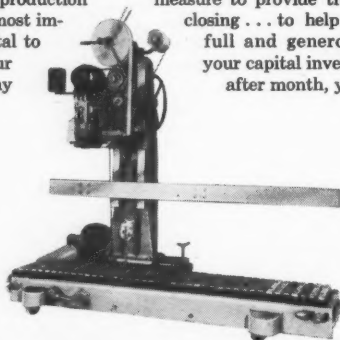
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farm chemicals outlook

Report from Washington

by Fred Bailey & Don Lerch

Mobilizers fear major smash-ups in defense plans unless they can get production back on schedule. They see mounting danger in the paradox of surplus in the midst of scarcity . . . full shelves during supposed high-level military production. Even the inflation specter hasn't lived up to their expectations.

Defense output is still scheduled to nearly double the present rate. Barring full-scale war, it may take 25 per cent of the Nation's total production next year. Current rate is under 15 per cent, less than hoped for. At the peak of World War II it took 40 per cent. Labor shortages will grow if plans for larger armies are ok'd by Congress.

Fertilizer industry is left in a touchy situation. While rumors of dire shortages flooded the country this Spring, the industry filled all orders for customers willing to look. Most USDA spokesmen expect farmers to find nearly all they want this fall. Superphosphate production for the year is predicted at record levels, in spite of the sulphur shortage . . . with possible heavy carryover.

Industry lag-time is the factor generally overlooked in shortage forecasts. Washington now wishes it had made that point stick during the scare epidemic. Those who took advantage of the situation then are on the spot now.

Delayed farm buying in retaliation is the new worry among some industry officials. While only an estimated 15 per cent of the tonnage is involved this fall, problem could reach serious proportions next spring when most of the fertilizer is moved. Washington expects careful inspections of buying trends to be made this fall.

USDA scientists are bolstering the "front office" with new statistics to back claims for expanded nitrogen capacity. Five special reports, released by the National Soils and Fertilizer Research Committee, are crammed with figures and charts showing how much more fertilizer will be needed to feed the bumper crop of babies. When translated into actual production, the new plant capacity would make existing facilities appear as mere pilot plants.

Agronomists estimate current corn yields in the 13 southern states at only a third of the potential. They foresee a billion-bushel increase if the right amount of nitrogen were used. This would push nitrogen demands in the South to over a million tons, nearly equal to the current total annual production.

Most USDA officials are optimistic over prospects for more nitrogen. Behind the desk pounding sessions with NPA, is the feeling that the bottleneck has been broken. Arguments are expected to continue . . . some shortages are predicted for next Spring, but the long-range picture appears brighter.

Morgantown is being counted on here as having a quieting effect on the Pentagon. With production likely to be rolling soon, the military feels more comfortable with a wider margin of safety.

More nitrogen production from new industry plants is a definite possibility, following months of frustrating delays in the maze of Washington's uncharted shoals. Several producers now possess licenses to hunt for the supplies needed to

build new plants. Washington is wondering where all the technical experts are coming from.

NPA is waiting for an answer to the question of how the industry produced superphosphate in record volume when supplies of sulphur had already been cut by basic producers. Some NPA officials had thought a cut of 15 to 20 per cent in sulphur meant a corresponding reduction in superphosphate. How the production was possible is apparently buried in the secrets of industry's productive genius.

Short sulphur supplies are expected to really pinch during the production of Spring goods. Tighter NPA controls and less industry "fat" are expected here to make a dent in marketable superphosphate supplies. Expeditors will be hitting the road on the double if Washington's predictions are realized. Acceptable solution is still shrouded in mystery, or simply not there at all.

No relief from foreign sulphur demands is in the offing according to most observers here. Rate of exports is expected to remain about the same for a long time to come. U. S. is putting a high value on every gun . . . every plane produced in Europe. Something has to give . . . apparently we are to continue giving.

OPS lawyers are targets for a new barrage of criticism. Industry is fighting mad over their attitude in obstructing the intent of Congress for adding additional cost of production factors in the computation of ceiling prices.

Industry representatives in the price agency admit they are stymied at nearly every turn by legal interpretations of the "fine print." "The lawyers are running the show," they charge. "Every time we get ready to act, bang, they find some reason why it can't be done."

Cedric Gran, special OPS fertilizer consultant, is "fading away" as fast as possible. He has been a principal draftsman of policies and procedures, subject to legal review. Now he is tending more to his own business with the Mathieson Chemical Corporation.

Howard Grady is following in Gran's footsteps. Plans to be out of his consultant role as quickly as possible . . . thinks he can make it this fall. He hopes the October 1 deadline for filing of form 8's by the pesticide industry will find OPS new price policies more stabilized.

Henry Huschke is now handling fertilizer and agricultural lime price problems as head of the agricultural chemicals section. Huschke, on leave from the Agricultural Limestone Institute . . . accepted the OPS position with industry backing.

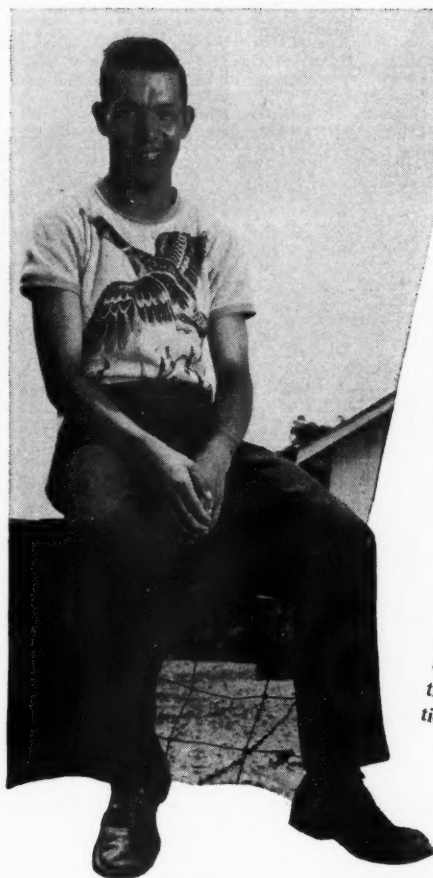
Weather is given "an assist" by pesticide makers for helping them win the supply battle for '51. Washington is not impressed by howls of shortages. Real shortages have been limited to relatively small areas . . . growers who beat the bushes found materials.

Real pinch in supplies could come next year as the USDA drives for larger acreages of many crops. Chief factors will be weather and supplies of chlorine, benzol, and alcohol.

Nation-wide crackdown on use of chemicals in food by the Food & Drug Administration is gaining momentum. Poultry and bread trades are singled out for stiff examination.

Delaney article in American magazine attacking "unsafe pesticide practices" touched off a stinging editorial by the National Agricultural Chemicals Association. It is considered by many the strongest position yet taken by the industry on what it terms a "highly contentious discussion of a few specific pesticides . . . which splash the manufacturer with mud from the roiled pool of generalities."

Industry fears a new rash of horror stories based on the Delaney "peril report." Some industry leaders are fighting mad over what they term unfair treatment by the Delaney investigating committee and the Food & Drug Administration.



250 pounds of Ammonium Sulphate increase corn yield 11 bushels an acre

JOHN M. COOPER OF SLIPPERY ROCK, PA., a vocational agriculture student, tested the direct application of Ammonium Sulphate on his 1950 corn crop and was more than pleased with the results.

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Isopropyl Ester
Ester and Amine salt solutions
Low-volatile Esters

2,4,5-T

Isopropyl and Butyl Esters
Low-volatile Esters



Birth Pangs of a Pesticide

Dr. E. L. Griffin, USDA, reports on the long, painful process that must be followed before a pesticide can be sold

MANY PEOPLE outside of the farm chemicals producing industry have the impression that placing a pest-control chemical on the market is a haphazard, slap-dash affair. Nothing could be further from the truth, as everyone in the industry knows. Seldom, however, do we get a clear-cut picture of exactly what does go on in bringing a pesticide to the farmer. Following are a few examples of the lengths to which a manufacturer must go in order to clear just one hurdle, that of registration under the Federal Insecticide, Fungicide, and Rodenticide Act of 1947.

Compound A

"After considerable work on this compound, by the manufacturer himself and experiment stations, on February 21, 1950, he requested a permit to ship 5000 pounds of insecticide containing 1250 pounds of Compound A to other experimenters for larger scale experimental work. With the request he submitted a copy of proposed labeling, chemical information on the compound, phytotoxicity tests, acute interperitoneal toxicity tests on mice showing the product to have about the same toxicity as DDT, effectiveness tests by a State experiment station and methods of determining it in low concentrations.

"Conferences with the manufacturer's director of research were held on March 2 and March 13. At these conferences the additional information which would be needed for registration was fully discussed. The experimental permit was granted on March 16, 1950, after certain changes in the proposed labeling had been made. The Food and Drug Administration was notified of the permit.

"At various times since then additional information has been furnished us concerning the product by the manufacturer, and on May 18 two additional experimental permits for 5000 pounds each of two other formulations of the compound were issued and the Food and Drug Administration was notified.

"An application for registration of the three formulations was received in late July, 1950, but the firm was informed that insufficient information had been submitted to justify registration. On August 16 a

The products are designated by letters A, B, C, and D, rather than their correct names because Dr. E. L. Griffin, Assistant Chief of the Insecticide Division, Production and Marketing Administration, USDA, who gave the examples in a hearing before the Delaney Committee, stated that information concerning the registration of particular economic poisons is not made public. This, however, does not detract from the accounts which make it very clear that the registration of a pesticide is no mere thing.

considerable amount of information on the stability, penetration and spray residue of Compound A was reported to us.

"Work on the toxicity of the compound was continued by the manufacturer and additional information furnished us by the manufacturer as to residues on treated products. Based on this information and with acquiescence of the Food and Drug Administration, the product was registered in February, 1951, *for use on beans only*. (Ed. note: Italics ours.)

Compound B

"On March 15, 1949, a large chemical concern requested a permit to ship 1000 pounds of a product containing approximately 30 per cent of the compound for experimental use in spraying against mites infesting orchards during the year following April 1, 1949. A considerable amount of experimental work on a small scale had previously been carried out by the firm and the warnings on the label were very extensive since the product was known to be quite toxic. On September 29, 1949, the firm's toxicologist discussed problems in connection with the product with our pharmacologist and on November 8 a copy of methods of analyses of spray residues was submitted to us.

"On January 10, 1950, inquiry was made as to the possibility of registering the product for general use. With this inquiry there were submitted reports of oral, skin absorption, interperitoneal and inhalation toxicity to laboratory animals. Short period chronic toxicity studies had also been carried out and the type of physiological action studied. No injury had de-

veloped to humans in the previous season's experimental use and spray residue determinations showed the product to disappear rapidly from treated fruit. No tainting or off flavor had been found. Considerable experimental information on the efficacy of the product was also submitted.

"After study by our own experts and discussions with the Bureau of Entomology and Plant Quarantine, the informational material together with proposed labeling was submitted to the Division of Industrial Hygiene of the Public Health Service and to the Food and Drug Administration for comment as to safety. Certain changes in cautions suggested by the Public Health Service were made. The Food and Drug Administration recommended that in marketing the product this be done with the same precautions and safeguards as those which have been recommended for parathion.

"The firm was informed on March 14 of changes in labeling necessary to justify registration. On March 20, 1950, after submission of certain revised labeling, the notice of registration was issued. Shortly thereafter a confidential statement was issued to State officials telling them of the action which had been taken in registering the compound as an economic poison. Early this year, after further submission of data and discussion with the Food and Drug Administration, the permitted uses have been somewhat extended.

Compound C

"After considerable preliminary testing of Compound C before the new Act went into effect, the manufacturer's representatives visited our office in November, 1948, to discuss the possibility of marketing it during 1949. The available information on the product was discussed and it appeared that the preparation was not ready for registration but that request might be made for a permit for shipment for experimental use in such a manner as to avoid danger of injury to humans.

"A permit providing for shipment of insecticides containing 5000 pounds of Compound C during 1949 was issued in January, 1949. The labels bore quite extensive poison warning and the testing was to be for general agricultural purposes. Further shipment of 2000 pounds of 60 per cent Compound C was permitted on May 13, 1949. The Food and Drug Administration was informed of the permit on May 26.

"The Bureau of Entomology and Plant Quarantine reported extensive and favorable experience with the product as a cotton insecticide during the summer of 1949. In September a conference was held with the manufacturer's representatives at which representatives of the Public Health Service and the Food and Drug Administration as well as the Department of Agriculture were present.

"The acute toxicity work was reported as fairly well advanced but chronic toxicity work had not been completed and was being continued. The effect of the product in the feed of cattle and in soils had been studied and additional work was discussed. A method for the determination of Compound C in small

amounts had been developed and some spray residue work had been done. The product was shown to be fairly volatile so that residues would not be expected to persist for long periods.

"During the next three months additional work was submitted to us, including confidential reports from the Public Health Service, data from the firm on examinations by qualified medical authorities of employees working with Compound C, and reports from the Bureau of Entomology and Plant Quarantine. In addition, a progress report on chronic toxicity studies was submitted which showed a considerable amount of information on the subject.

"On the basis of all of this experience, the manufacturer requested registration for use of the product as a cotton insecticide only. Proposed labeling was submitted. After full consideration by ourselves and by representatives of the Public Health Service with respect to safety to users, registration for cotton insecticide use only was issued in March, 1950.

"Meanwhile, a permit for shipment for experimental use for other purposes was continued. In July, 1950, after several more conferences with representatives of the manufacturer and of the Bureau of Entomology and Plant Quarantine, additional claims for use against grasshoppers where it could be applied in such a manner as to avoid contamination of food or feed for animals were accepted. State officials have been kept informed of our action. There has as yet been no Federal registration for use on foods or in such a way that it appears likely to contaminate foods.

Compound D

"This compound has been developed by the same manufacturer as the one just mentioned. It is highly toxic to man and somewhat less volatile than Compound C and, therefore, more likely to leave long lasting residues. The consideration of this product has paralleled that of Compound C.

"Very extensive work both on its effectiveness and on its toxicity to warm-blooded animals has been carried out by the Public Health Service. Shipments for experimental work, 5000 pounds during 1949 and a similar amount in 1950, were permitted. The permit excluded application to food and forage crops.

"The manufacturer has at various times submitted information on the effectiveness and toxicity of this product and in December, 1949, requested registration for limited uses. This was discussed with the Public Health Service and registration withheld pending further information. During the spring and summer of 1950 there were a number of conferences with representatives of the manufacturer and in September a further request for registration for certain non-food uses was received.

"Registration was not granted at that time, primarily because we were not assured of the safety to humans when frequently or continuously exposed to the product by skin contact or by inhalation. On the basis of information received since that time and with the agreement of the Public Health Service it is now being registered solely for use against cotton-infesting insects." ♦

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Businessmen recognize inflation as the nation's greatest single threat. But most of us have felt "What can one man—even one business—do to stop it?" But there is a way—if enough of us work at it. We can

help more people . . . the men and women who work and vote and pay taxes . . . to understand the nature of inflation, its causes and cures. Then we will have gone a long way toward eliminating this pending catastrophe.

ONE TOOL YOU CAN USE: To help us give our own Bemis workers the inflation picture, we used the colorful, new 16-page booklet "How Stalin Hopes We Will Destroy America" produced by Pictorial Media, Inc. The more widely the booklet is used, the more good it will do . . . and it is available for distribution to your workers, too. It follows the time-proven "comic book" technique . . . dramatizes the dangers . . . and shows how all our citizens can help halt inflation before it's too late.

TESTS SHOW IT HELPS WORKERS: To get an impartial judgment of the value of "How Stalin Hopes We Will Destroy America," it was tested in Bemis plants by the Psychological Corporation under the direction of Dr. Henry C. Link, a foremost research authority.

Dr. Link says "Those workers exposed to the booklet were found to have a significantly higher appreciation of the recommended ways to stop inflation than did the workers who did not see the booklet. Details of this test are available upon request." And Bemis factory workers make such statements as "Everything it says hit home, but you'd never figure it out for yourself

until you read it" . . . "It's told in an interesting way so anyone can understand. My daughter, age ten, understood all of it" . . . "In picture form it impresses you more. Most people don't read about it" . . . "Had ideas that we wouldn't think about otherwise while we are working away—good book, agree with it—I guess I won't be the only one."

Because we believe this message is growing more urgent every day, Bemis is taking this means to commend to other businesses this weapon against inflation. It is the first of a series of such material that we expect to use.

BEMIS BRO. BAG CO.

St. Louis 2, Missouri

FOR EVERY BUSINESS, LARGE OR SMALL: In quantities, it costs only a few cents a copy—\$10.00 for 100 copies, down to 3 cents per copy in larger quantities. Single copy free. For full information, write PICTORIAL MEDIA, INC., Attention: Paul Wheeler, 205 E. 42nd ST., NEW YORK 17, N.Y.

Phosphorus

A Vital Plant Food, It Is Basic to Entire Fertilizer Industry

Dr. Vincent Sauchelli

Davison Chemical Co.

PHOSPHORUS has a vital relationship, not only to fertilizers, but to everyone engaged in the fertilizer industry. The miner of the raw materials, the processor who converts them into more useful, more valuable plant foods, the soil scientist who seeks how to feed plants more effectively,

and the sales executive whose function is so necessary to the existence and prosperity of the entire enterprise, to all of these people, phosphorus is of prime importance.

Discovery of Phosphorus

The discovery of phosphorus, announced almost simultaneously by three scientists (Brandt and Kunckel of Germany, and Boyle of England) working independently of

one another, took place in 1669. It was destined to become one of the most remarkable discoveries of chemical science.

A century later, Galm discovered the existence of phosphorus in calcined bone, but it was left to the Swedish chemist Sheele to reveal a practical method for obtaining phosphorus from this same source. Some years later Marggraf, who discovered sugar in the sugar-beet root, disclosed the form in which phosphorus existed in urine. Guided by this research, Pott was able to show the presence of phosphorus in cereal grains and to establish that such grains were the principal source of phosphorus in the human body. Subsequent research confirmed this, and de Saussure in Switzerland showed by chemical analysis that many species of plants contained phosphorus in their tissues.

Those primary studies opened the door to later commercial developments. These were initiated through brilliant research studies in Germany by von Liebig, in England by the Duke of Richmond with bones and Gilbert and Lawes with coprolites and other mineral phosphates. The initial successes stimulated interest in phosphates in all civilized countries.

American Deposits

On this continent commercial developments began with the dis-

At Davison's rock phosphate plant in Bartow, Florida, a hydraulic gun is used for sluicing rock phosphate matrix to a sump. From there it is pumped to the washing plant as the first step in conversion to superphosphate, the plant food so widely used by the world's agriculture.



covery of phosphate deposits in South Carolina in 1867. With the discovery and utilization of the remarkable deposits in Florida, Tennessee, and North Africa, world consumption started its upward climb. World agriculture responded quickly to accessions of this essential plant nutrient. Commensurate with this rising demand a worldwide phosphate industry came into being, destined to grow lustily. In the last year of record—1949—about 20,000,000 long tons of rock phosphate were mined, and over 5,700,000 million tons of phosphoric acid, P_2O_5 , were marketed in all countries for agricultural purposes.

Indispensable Element

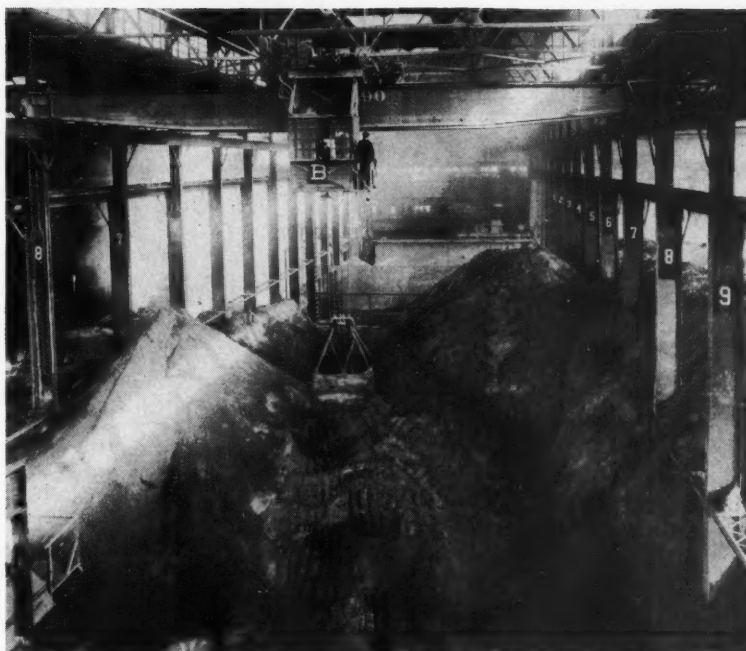
Thus, by slow but steady progress, the chance discovery of phosphorus was transformed by the alchemy of vision, enterprise, and sweat into one of the indispensable materials for the advancement of agriculture, the improvement of private and public health, and the prolongation and enjoyment of human life.

It is known that a major material invention can produce multiple effects. Just as the invention of the cotton gin brought about new industries, new clothing, and different styles and transformed the prevailing conception of manufacturing; so the development of the rock phosphate mining industry is associated with a cluster of inventions and integrated developments in agriculture and the processing industries.

Extraction Methods

Today's methods of extracting rock phosphate stand in sharp contrast with the back-breaking, pick and shovel, wheelbarrow-and-mule methods of the 1860's. Labor saving, technological changes highlight this progress: the old manual operation changed steadily from steam to electric power. First came steam shovels and railroad haulage; next, hydraulic monitors capable of hurling streams of water of 200 pounds of pressure to break up the overburden and matrix; and then the giant 1250 horsepower, electrically driven draglines, equipped with booms 215 feet long and buckets of 21 cubic yards capacity, and capa-

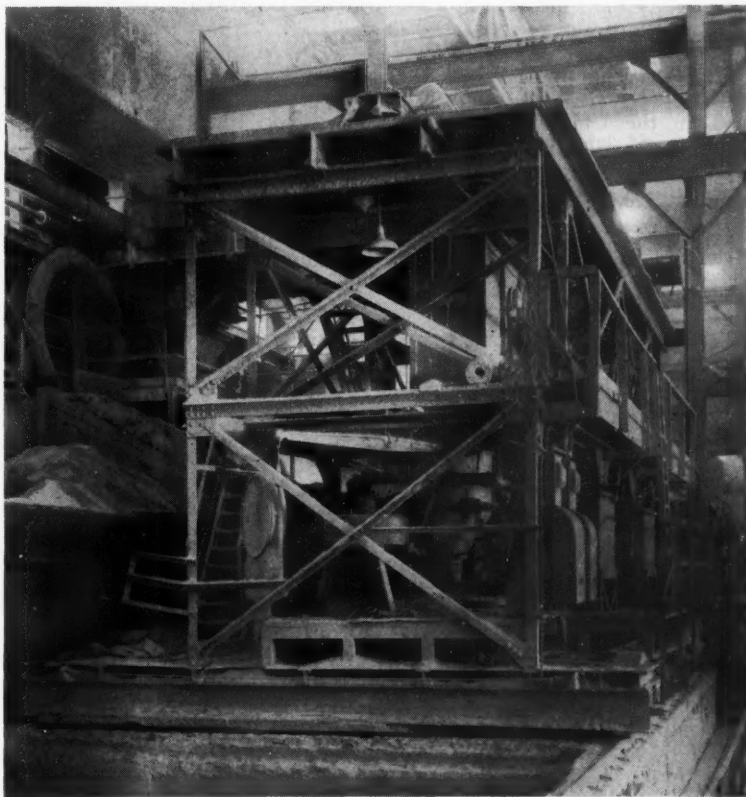
AUGUST, 1951



All photos courtesy Davidson Chemical Co.

Phosphate rock dust storage bin and crane, at the Curtis Bay Works, of the Davison Chemical Company, at Baltimore. In the background of the photograph can be seen superphosphate dens and the acid mixing machine.

This is the mechanical mixing platform at the Curtis Bay works, where the phosphate rock dust and sulfuric acid are mixed and dropped into bin beneath it. Storage bin for the rock dust is located at the right.





Davison's Rock Phosphate Division plant at Bartow, Florida, is shown in this aerial view. At left center is the new flotation plant; lower left, table plant; lower center, washer plant; lower right, 40-foot raw feed storage bins; upper center, 150-foot hydro-separator; and at the top of this picture is shown a part of the four-hundred-acre settling pond.

ble of removing 18 tons of overburden every 45 seconds of operating time, or 1500 tons an hour. Labor saving? The dragline requires only three men per shift; to do the same work in the steam shovel-locomotive era required 40 men.

From 1870 on the growth of the phosphate and total fertilizer industries has been steadily upward. In 1880 the United States consumed 1,150,000 tons of commercial fertilizer, 166,200 long tons of rock and 320,000 net tons of ordinary superphosphate. In 1910 the consumption was 2,600,000 tons of phosphate rock, 2,900,000 tons of superphosphate, and 5,453,000 tons of fertilizers. Today look at the picture: The United States consumed in the year ended June 30, 1950, more than 18,000,000 tons of commercial fertilizer. The industry marketed about 9,000,000 tons of rock and about 9,000,000 tons of superphosphate, 18 per cent equivalent, most of which was of course used in the production of the mixed fertilizers.

Canadian Record

The Canadian record also is impressive. For the year ended June 30, 1949, Canada produced 680,261 tons of mixed fertilizers and 1,096,-

837 tons of fertilizer materials; and imported 501,495 long tons of phosphate rock, 133,130 tons of superphosphate, and 113,189 tons of muriate of potash. About 20 per cent of the rock phosphate was used in producing phosphoric acid for industrial purposes.

Low-Grade Ores

Technological improvements never cease in a competitive industry. Brief reference has been made to the mechanization of the mining process. Many other inventions and advances in technology have been integrated in the process to achieve the present economical operation. One development deserving special mention is flotation, adapted to rock mining from other ore extracting industries. By means of flotation it is now possible to recover phosphate rock fines of less than 20 mesh size. These fines constitute from about 20 per cent of the total phosphate of lower grade rock (66 to 68 per cent BPL) up to about 85 per cent of the higher grade. By this means alone millions of tons of phosphate previously discarded are now recoverable. The process has had the effect of conserving our precious phosphorus resources.

In processing rock to produce soluble phosphates many technol-

ogical advances in Europe and America have increased the efficiency of operation and greatly improved both the content of available P_2O_5 and the physical quality of the product. Since 1850 superphosphate has been the basis of the world's commercial fertilizer industry. It continues to be the world's premier source of phosphoric acid for agricultural purposes. The "wet" method of producing superphosphate has from its inception held first rank because of its simplicity and economical operation. Furnace methods are receiving serious consideration but continue to be more costly and unable to compete with the wet method.

Mechanization

The superphosphate manufacturing industry in the United States, in fact in the world, has since the turn of the century also been influenced by the trend toward mechanization. Chemical engineering has participated more and more in the designing and operation of the more modern plants. The average content of soluble P_2O_5 in superphosphate has climbed from about 14 per cent in 1900 to its present level of 20 per cent. Quality has also improved by lowering the average moisture content and by granulation. Man-labor-hours per ton of superphosphate have been substantially reduced, mechanical dens both batch and continuous have become quite universal. Present capacity in the United States for normal grades of superphosphate is contained in about 200 plants and is close to 2,750,000 tons of P_2O_5 per annum; and for concentrated grades, about 300,000 tons of P_2O_5 produced at nine plants. The expectation is that owing to the demand for increasing amounts of triple superphosphate the capacity to produce concentrated material will be expanded. This farmer demand is supported by economies in bagging and handling costs and in transportation and cannot be ignored.

Sulfur Needed

To produce superphosphate, it is necessary to have sulfuric acid. Brimstone sulfur from the sulfur domes of Louisiana and Texas has

been one of the most favorable factors in the development of our domestic superphosphate industry. The threatened depletion of this source of sulfur is serious. Some estimates indicate that within the next 15 years these deposits will be exhausted. This will force the industry to employ new and more costly sources of sulfur such as pyrites and other sulfur compounds. Nitric acid alone or with other acids for acidulating the rock will now receive more favorable attention.

New Processes

It is reasonable to expect that new processes and new products will appear in the industry. Among the other phosphates that now look promising but are too costly to produce competitively are: potassium metaphosphate, diammonium phosphate, and magnesium ammonium phosphate. Furnace methods may make it possible to produce the element phosphorus or the anhydride P_2O_5 at the mines in the West for shipment to eastern consuming points where they can be economically processed into desirable compounds. War pressures have a way of expediting technological developments. Many new processes now in the blueprint stage could suddenly be developed into the large-scale, commercial production stage under the driving necessity of war.

It is hard to prophesy the future. Of one thing we can be certain: it will be different. Change is inevitable. Our industry is very closely associated with agriculture, and as it evolves so must we. That has been the history of the two.

One of the fundamental factors in the development of our industry was the concept concerned with the mineral nutrition of plant life. This principle was established as a physiological fact by 1840 through the researches of de Saussure, Boussingault, and Liebig, and this knowledge laid the foundation of the commercial plant food industry.

Phosphorus Depletion

Another scientific fact influencing our development was the recognition by soil scientists that soil fer-

tility is being depleted constantly by cropping and grazing. The National Resources Board in the United States prior to World War II estimated that our national soil loss in terms of phosphate withdrawals exceeded replenishment by more than 3,200,000 tons of P_2O_5 , or say, the equivalent of more than 16,000,000 tons of 20 per cent superphosphate. And a special committee of the Association of Land Grant Colleges and Universities concluded in 1946 that American farmers should use more than 6,000,000 tons of P_2O_5 (30,000,000 tons 20 per cent equivalent) annually to take care of depletions and provide for normal soil building. Comparing these estimates of need with actual production it is evident that in no year of recent history has production ever approached even closely the estimated need.

Several years ago soil surveys were made in Ontario and people were startled at the evidence: the water shortage revealed by drying up of wells and streams; the silting of lakes, rivers, and dams; and the alarming decrease of minerals in all crop soils. Farm animals have revealed this reduction of soil minerals in many sections of Canada and the United States by their failure to breed, by difficult parturition and by abortions, by soft bones

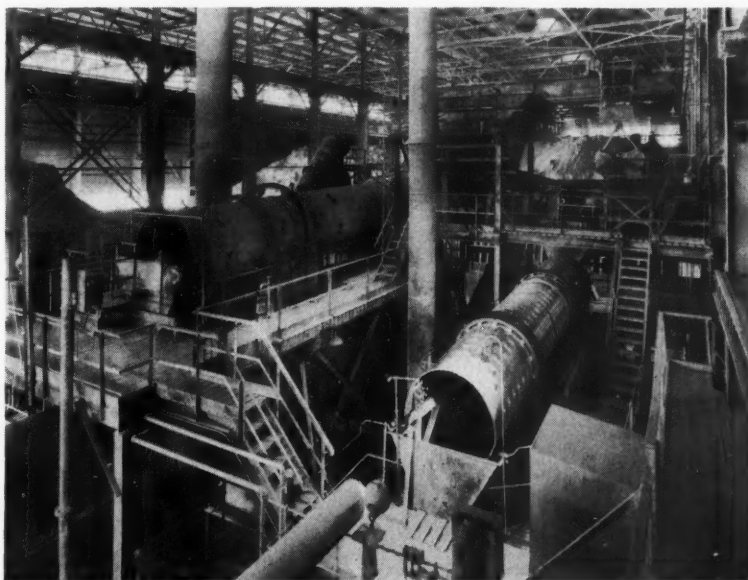
or faulty bone structure, low fat content of milk and a general lack of thrift. If minerals are not in the soil the forage crops grown on such soils will be deficient in them also: a plant cannot fabricate minerals as it can carbohydrates and fats. And the same symptoms, more or less intense, are revealed by humans restricted to the produce of those impoverished soils.

Industry Challenged

The evidence is clear and decisive that properly fertilized crops have a higher mineral content than those raised on depleted soils. French scientists, physicians, and veterinarians have reported extensively on the sufferings of all living things as a result of phosphorus deficiency during the period the Germans occupied France in the recent World War. This is not the time to present the mass of information that has been accumulated by the scientific groups concerned with mineral nutritional problems, but, as leaders of progressive thinking and action, we are being challenged as never before to put science to work in agriculture and in our business.

How does all this tie in with our present situation? Well, we are getting away from the traditional

Much of the equipment needed for making higher quality phosphorus-bearing fertilizers may be seen in this view of the Curtis Bay works conditioner and operating platform for the granulating units of 1000-ton capacity. Spray valves, flood light, and instrument panel are also shown.





**Sackett Builds The Equipment
You Need**

- ★ ONE MAN BATCH WEIGH SYSTEMS
- ★ PLANT MODERNIZATION PROGRAMS
- ★ CONTINUOUS AMMONIATION UNITS
- ★ MIXING AND SHIPPING EQUIPMENT

Aerating Equipment
Automatic Control Equipment
Basing Units
Belt Conveyors
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Continuous Ammoniating Systems
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**GET THE RIGHT ANSWER TO YOUR
PRODUCTION PROBLEMS**



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1707 S. HIGHLAND AVENUE
BALTIMORE 24, MARYLAND**

idea of fertilizer as a quick stimulant for bigger yields. That concept is changing. Farmers and many in our own industry are beginning to realize that fertilizer can and should be considered as a bulwark of permanent, prosperous soil building. This newer and broader concept involves our future national security.

Soil Needs

As it becomes more generally appreciated and accepted, the demand for our products will be influenced more by the needs of national nutrition and sound farming practices than, as in the past, by the size of the last year's farm income. From this should develop a greatly expanded market—easily three to four times the present market, at least for some materials of our industry.

The leadership and managerial skill of the fertilizer industry are faced with this challenge of a greater public concern for the future of our soils and of public health. The opportunity to serve the public interest and incidentally our own interest in the next quarter of a century has never before been so attractively presented to the industry in its long years of service to agriculture and country.

I propose that we hitch our sales policies to the concept that farmers should buy fertilizer on the basis of the real needs of soil and crops, not on the previous year's cash farm income. Our fertilizer is to be considered a bulwark of permanent soil building in addition to being a means for increasing yields. The need for phosphorus is to be measured by no less than the amount required to maintain a permanent, prosperous agriculture. Some may scoff at this as too idealistic, too radical a change. We shall have to persuade and convince such that they are wrong.

New Sales Techniques

We shall have to overhaul some of the traditional methods of merchandising our products. Sales policies and selling techniques need revamping, modernization to fit in with our broader concept of service to agriculture. Sales staffs will have to be trained to serve, in the best sense of the word. The salesman is

to be taught to persuade farmers to use phosphates and other fertilizers to increase yield and quality of the harvest and to build up the productivity and dollar value of the soil by scientifically established practices. In this program of broader service phosphorus will play a stellar role. Phosphorus is usually the first limiting factor in most crop soils. It has to be applied in generous quantities to become effective. Because of its essential role it seems to me the units of the industry concerned with the production and sale of phosphatic materials have an unlimited future market.

We should critically review traditional concepts and methods and selectively adopt new procedures that will enable us to grow more and better food crops on the same or fewer acres. I urge agronomists to investigate the concepts inherent in the laws of plant growth relative to nutrient supply as developed by Mitscherlich, Spillman, Crowther, Willcox, Bondorff, and other colleagues.

Keep Open Mind

Let us keep an open mind in seeking new knowledge. We as an industry should want to evaluate the claims of these scientists and give aid to whatever field and greenhouse work may be necessary to determine the correctness of their theories. Laws of plant growth and of the effect of each plant nutrient in evoking the capacity of a plant to produce its maximum yield of grain, fruit, sugar, protein should be established by intensive, co-operative research. Their tremendous potential influence on future use of soil and fertilizer resources justifies this suggested series of research projects.

The impact of chemistry on farming has already been tremendous. It is safe to predict that research using the radioactive tracer technique (Ed. Note: see page 24, AMERICAN FERTILIZER AND ALLIED CHEMICALS, May, 1951) will inevitably teach us a great deal more about how plants grow and how we may increase their yields through more efficient methods of applying lime, fertilizers, pesticides, and hormones. It is indeed an exciting picture. ♦

FARM CHEMICALS

SACKETT FERTILIZER PROCESSING SYSTEMS PAY OFF

These fast fertilizer processing systems have reduced production costs in some plants as much as 65% . . . An estimated cost savings included with a Sackett survey of your production operations may even exceed this figure.



SACKETT ONE MAN BATCH-WEIGH SYSTEM

1. Eliminates waste of manpower.
2. Fast-acting weigh valves and printed weigh record provides more rapid and accurate weighing.
3. Circular design of storage hopper accelerates flow of ingredients through weigh valves . . . no corners or valley angles to retard flow of material.
4. Its compact design permits installation in existing buildings with minimum alterations.
5. The installation of this system does not, in any way, disturb existing mixing facilities.

Built in four sizes, 25 tons to 100 tons per hour.



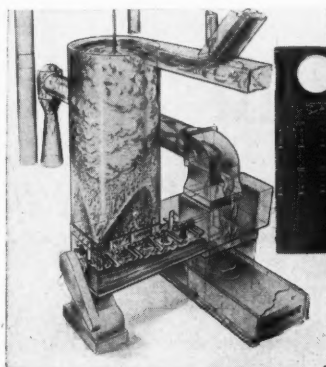
CONTROL PANEL

SACKETT *Super-Flo*... A CONTINUOUS SUPERPHOSPHATE MANUFACTURING PROCESS

This new Sackett-conceived and developed process produces a superphosphate of premium quality in either powdered or granular form. Its complete mechanization and centralized panel control brings to the industry entirely new conceptions of high production speeds, low manufacturing costs and quality product control.

These Sackett patented processes are built in three sizes, 25 tons to 75 tons per hour.

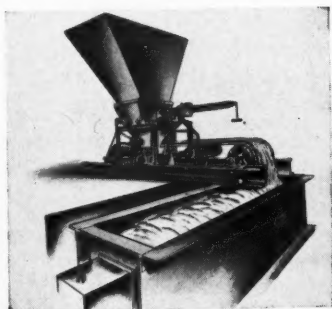
Exclusive suspended acidulation produces highly converted superphosphate of excellent quality.



CONTROL PANEL
Central control panel shown above is nerve center of Super-Flo Process. Plant is operated from this point by one man.

SACKETT CONTINUOUS AMMONIATING SYSTEM

The patented Sackett Continuous Ammoniation System is now being offered in four sizes with capacities ranging from 25 tons per hour to 100 tons per hour. This highly efficient method of ammoniating superphosphates and mixed goods with solutions offers many important advantages and is easily installed in connection with existing basing equipment. Higher ammoniation rates are made possible by its accurate proportioning of solids and solutions and lower reactive temperatures due to its exclusive aerating action which takes place during ammoniation. This system is also built in pressurized design for anhydrous ammonia or solutions having high vapor pressures.



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Without dust control, working conditions at many locations in farm chemicals plants would be like this. Dust control system turned off just for photo.



With dust control unit operating, this bag filling station is free of dangerous (and valuable) dusts. Dust recovered here is piped to central collector.

Central Dust Control Unit

**Keeps Insecticide Plant Clean,
Removes Employee Health Hazard**

W. O. Vedder

Pangborn Corporation

AS MANY of the labels on pesticide packages indicate, farm chemicals dusts can be toxic to humans as well as insects. Most warnings have been aimed at the ultimate user—the farmer or pest-control operator—but pesticide manufacturers have long been faced with the problem of protecting their workers from the dusts within the processing plants. Dusts such as DDT, copper, sulfur, rotenone, and rothane require a much higher degree of control than ordinary industrial dusts because of the increased hazards involved.

To meet this problem in their plant at Riverhead, N. Y., the Long Island Produce and Fertilizer Company installed a dust control system covering all points from which dust might escape. The

system not only safeguards the health of employees but also eliminates the circulation and settling of dust within the plant. Further, the system collects marketable dusts which might otherwise escape and be lost.

Process Dust-Proofed

Hoppers, mixing bins, vertical and inclined bucket conveyors, and horizontal screw-type conveyors, are encased in dust-tight housings. All openings through which raw materials are charged for mixing and all outlets through which sized dust is bagged, are provided with exhaust hoods. Bag tying stations are also provided with hoods. The hoods are, of course, connected by piping to a dust collector and exhaust. Each hood is designed to control the maximum amount of dust laden air from the operation it serves, and also to avoid dis-

turbing dust-free air surrounding the operation.

The Long Island Produce and Fertilizer Company has two mixing machines—one of $\frac{1}{2}$ -ton and the other of 1-ton capacity. Both mixers are below floor level and the openings through which raw ingredients are charged are covered with hoods. These hoods not only prevent dust from escaping during bag-emptying operations but also exhaust any dust which may tend to rise and escape during mixing.

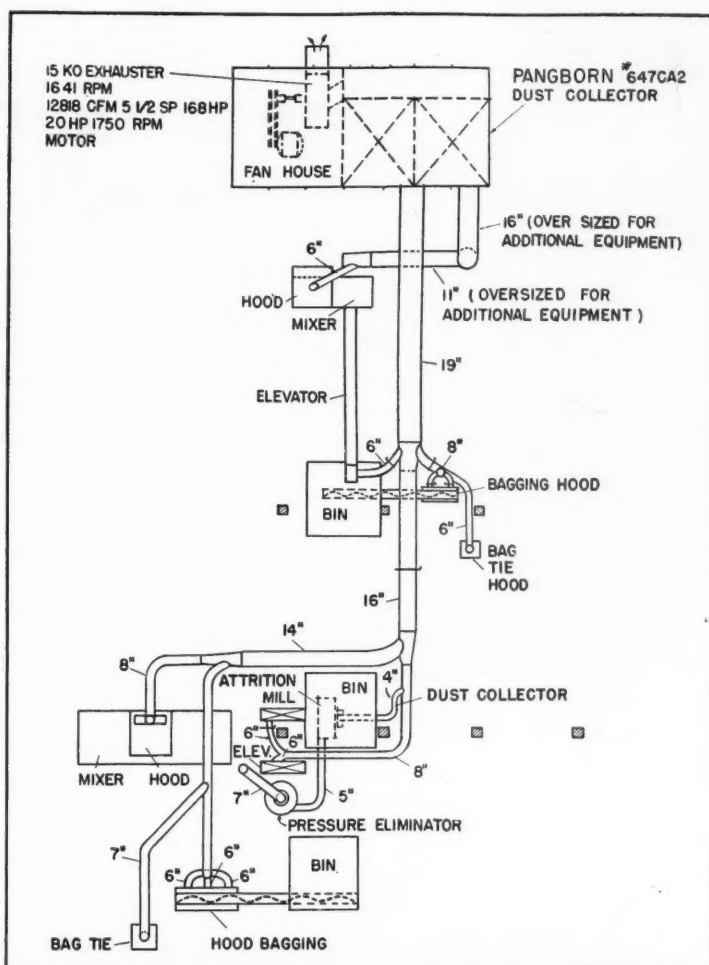
In the bagging operation, bags rest on scales so that the operator can shut off the flow from an overhead hopper when the predetermined weight has been reached.

Many pains have been taken to make the plant dust free. It was found that dust was escaping through the bearings of an attrition mill so this source was covered with a hood and the hood con-

nected with the piping of the dust control system.

A dust collector installed by the Pangborn Corporation collects all the dust conveyed to it by piping from the various hoods. The collector is a cloth-screen type, and is situated outside the plant. This type of filter has proven highly efficient for collecting finely divided dry dust. It is composed of a series of filter fabric covered metal screen frames, housed in a steel casing. A large proportion of the dust drops into hoppers below the screens as dust laden air is drawn through the collector. The rest is caught on the filter fabric bags themselves. The screens are rapped twice a day—once at lunch and once at the end of the day—to knock the dust into the hoppers. However, if more than one kind of dust is mixed during the day, the dust collector hoppers must be emptied before mixing the second dust, otherwise the two become mixed and unmarketable.

The insecticide plant of Long Island Produce and Fertilizer Company can mix upwards of 45 tons of insecticide per day. The carefully engineered dust control system enables this production rate to be maintained in a dust controlled atmosphere, fully approved by the New York State Labor department. ♦



This plan view shows how the pesticide-formulation equipment at the Long Island Produce and Fertilizer Company's plant has been laid out for compactness, yet allowed for additional expansion of the plant.

Raw ingredients for pesticides formulated at Long Island Produce and Fertilizer plant are emptied into hooded mixers. Dust-tight elevators convey mixtures to hoppers feeding bag-filling stations.



AUGUST, 1951

Automatic bag-tying machines used at Long Island Produce & Fertilizer Company are covered with dust-tight hoods. Dust which escapes during operation is withdrawn to central dust collector.





SEVEN SOLUTIONS TO THE *Sulfur Shortage*

Since sulfuric acid is vital to almost every industry, the current shortage of elemental sulfur, from which this acid is generally derived, is a serious matter and has a world-wide effect. Waste materials that can be converted into sulfuric acid and unworked sulfur bearing ores hold the

answer to the sulfur shortage. Chemico offers proven processes for utilizing such sources of sulfur. If you have a source, in commercial quantities, of any of the following materials, please give us details. We will then be glad to make specific recommendations without obligation.

WASTE MATERIALS

1. Spent Alkylation Acid, a refinery by-product in the manufacture of high octane gasoline, can be regenerated into fresh sulfuric acid of any desired strength.

2. Oil Refinery Sludge is another refinery by-product resulting from the treatment of petroleum fractions. The acid content is recovered as fresh acid of high strength.

3. Waste Iron Sulfate-Acid Solutions are by-products from steel mills and titanium pigment manufacturing plants. The sulfuric acid is concentrated for re-use and the iron sulfate converted to fresh sulfuric acid.

4. Smelter Gas results from metallurgical operations where sulfide ores are roasted preliminary to the recovery of metals. The gas is cleaned and processed into fresh sulfuric acid.

5. Coke Oven, Natural and Refinery Gases contain sulfur as hydrogen sulfide. This may be reduced to sulfur or extracted directly as a raw material for producing sulfuric acid.

SULFUR BEARING ORES

6. Pyrites and other metal sulfides are roasted to produce sulfur dioxide gas which is then converted into sulfuric acid.

7. Low-grade Surface Deposits containing sulfur in elemental form are treated by a new and economically sound process which recovers the high quality sulfur necessary for modern contact plant operation.

Chemico offers 37 years of experience in the design and construction of efficient plants for the manufacture of sulfuric acid and other heavy chemicals . . . on a one-contract, one-responsibility, performance-guaranteed basis.

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*Chemico plants are
profitable investments*

Delaney Hearings Debate:

Do We Need Pest-Control Chemicals?

Part III

Dr. Bishopp and Dr. Knipling, Bureau of Entomology and Plant Quarantine, give further evidence on pesticides

Cross Examination by Committee

June 14, 1951

Mr. Kleinfeld: Dr. Bishopp, is parathion widely used as an insecticide?

Dr. Bishopp: Well, if you mean widely, in the sense of over large areas, or large numbers of different crops, I would say not particularly. It is more or less restricted to certain extensive crops, such as wheat, in the case of the green bug, and to some extent on fruit for fruit insects.

In our recommendations regarding the use of parathion, it is the practice of the Department and of many of the states, to restrict the recommendations to special problems, that is, problems where the insects cannot well be controlled by other less hazardous material. . . . we recommended against the employment of hand applicators where a man would be continuously exposed.

Mr. Kleinfeld: Is it used on fruits at all?

Dr. Bishopp: Yes, it is used to a considerable extent on fruits. Most of that, however, is not in accordance with the recommendations of the Department of Agriculture.

Mr. Kleinfeld: What do you mean it is not in accordance with the recommendations?

Dr. Bishopp: We have felt that . . . this material should only be used by men who are informed on the hazards involved, proper usage and proper dosage, and therefore it is kept in rather strict control.

Mr. Kleinfeld: You have not recommended against its use on fruits, have you?

Dr. Bishopp: Not specifically.

Mr. Kleinfeld: Now, if parathion is highly toxic to all species of animals—it is, is it not?

Dr. Bishopp: That is right.

Mr. Kleinfeld: In fact it is among the most toxic of materials commonly used for pest control?

Dr. Bishopp: Yes, sir.

Mr. Kleinfeld: Is it a fact that exposure to various organic phosphoric compounds has caused several deaths and moderate to severe acute poisoning in a comparatively large number of persons?

Dr. Bishopp: Yes. There have been eight deaths directly attributable to the use of parathion. Those cases were of acute poisoning due to men handling the material, either putting it into airplanes or applying it themselves. (There then followed a discussion of illness and toxemia, as well as poisoning.)

Mr. Kleinfeld: Dr. Bishopp, what is a safe residue level, in your opinion, on any one item of the diet for parathion.

Dr. Bishopp: I think a statement has been published by the Food and Drug Administration that two parts per million may be safe. I feel that is perhaps a bit high with a material as poisonous as that.

Mr. Kleinfeld: There is a paper entitled, "Absorption of DDT and Parathion by Fruits" which was presented at the meeting of the American Chemical Society in 1949 by four representatives of the University of California. The report shows that, based on the weight of the peel only, approximately three to five parts per million of parathion were found in the peel of Valencia oranges 6 months after treatments were started with a standard dose.

Dr. Bishopp: California Valencia oranges have pretty thick skins, and they can hold quite a lot of material of that kind. I think there is authentic evidence that it does enter the peel of citrus fruits.

Mr. Kleinfeld: And would not the parathion contained in the peel of such an orange be present in orange juice that might be squeezed from such oranges?

Dr. Bishopp: I suppose there might be a very slight bit removed under pressure with the oil. (Mr. Kleinfeld then quoted from the above-mentioned article.)

Mr. Kleinfeld: So there is a lot that we have to learn about parathion, is that correct?

Dr. Bishopp: Certainly. (There then followed a discussion of Dr. Bishopp's testimony given previously from prepared statements.)

Mr. Kleinfeld: Is it safe to assume that, after 1945, DDT applied as a dust or as a wettable powder in water would not be absorbed by cattle?

Dr. Bishopp: I think that was a reasonably safe conclusion.

Mr. Kleinfeld: Did you bring out shortly after 1945 the recommendation that it might not be safe, based on what had appeared in the literature, to use DDT in dairy barns around cows?

Dr. Bishopp: No, not right at the time.

Mr. Kleinfeld: You do not believe that you have sufficient information to warrant the issuance of a recommendation against the use of DDT on dairy cows or in barns?

Dr. Bishopp: No. We felt safe in our recommendation of the use of DDT on livestock and in barns.

Mr. Kleinfeld: You said that dairy cows sprayed with DDT excreted it in the milk, and that shortly thereafter the Bureau of Entomology and Plant Quarantine confirmed it and demonstrated that dairy cows that had been treated with DDT also excreted small amounts in their milk. When was this?

Dr. Bishopp: Can you answer that, Dr. Knippling? (Dr. Edward F. Knippling, also of the Bureau of Entomology and Plant Quarantine, appeared with Dr. Bishopp at this hearing.)

Dr. Knippling: The work of the Oklahoma Experiment Station, as I recall, was done in 1946. The work involved excessive doses of DDT, much higher dosages than were recommended for insect control or dairy cattle. . . . I would like to point out that the quantities involved, the quantities of DDT involved in the milk, or that appeared in milk as when the insecticide is used for insect control, was on the order of an average of about 0.5 or 0.6 parts per million of DDT in the milk during the period of insect control. From the standpoint of average consumption, so far as the public is concerned, that probably would not exceed 0.25 parts per million.

(Following a discussion of dates of publication of the above information, the questioning continued.)

Mr. Kleinfeld: Is it your position that it is all right to have DDT in milk?

Dr. Bishopp: No.

Dr. Miller: Now to come to a more practical approach to it, is chlordane or DDT effective in the use to control chiggers, and Japanese beetles and ticks, and things of that type around lawns?

Dr. Bishopp: Well, that is generalizing perhaps a little too much. Those materials you mentioned, or at least chlordane at $\frac{1}{2}$ -pound per acre is quite effective in controlling the chiggers in lawns.

Dr. Miller: How about mosquitoes?

Dr. Bishopp: And reasonably so with mosquitoes. DDT is depended upon mainly as an agent for mosquito control, and it is very widely used by the Public Health Service.

Dr. Miller: What is the other, parathion?

Dr. Bishopp: No, parathion has never been recommended for use around households. We consider it far too hazardous for household use.

Dr. Miller: Do you use it for ants?

Dr. Bishopp: Chlordane is used for ants.

Dr. Miller: But not parathion?

Dr. Bishopp: No, not parathion.

Mr. Kleinfeld: You refer to "unreasonable restrictions" upon the use of pesticides. In the event that existing law was amended so as to require that there be complete pre-testing of pesticides before they are released to the public, including chronic toxicity testing, would you consider such a requirement to be an unreasonable restriction?

Dr. Bishopp: I think we have essentially that requirement now.

Mr. Kleinfeld: Would you consider such a requirement to be an unreasonable restriction?

Dr. Bishopp: No, I think not. I think it is essential to have pre-testing.

Mr. Kleinfeld: You said "unreasonable restrictions

upon the use of pesticides "will tend to stifle research." Would such a legal requirement tend to stifle research, in your opinion?

Dr. Bishopp: If I caught all of the statement you read, I think it would not.

Mr. Kleinfeld: Did we know as much about DDT when it was first employed in agriculture as we do now?

Dr. Bishopp: Naturally not.

Mr. Kleinfeld: So that under existing law it was used widely without knowing nearly enough about it.

Dr. Bishopp: Without knowing *all* about it.

Mr. Kleinfeld: We did not know that it would be absorbed by dairy cows, did we?

Dr. Bishopp: That is true.

Mr. Kleinfeld: And if you had known that, you would have advised against its use, is that correct?

Dr. Bishopp: If we knew than what we know about it today, we would have advised against its use for that purpose.

Mr. Kleinfeld: Dr. Bishopp, on page 13 of your statement, you discuss the chlorinated hydrocarbons. What are a few of those?

Dr. Bishopp: Well, DDT was the first one that came into general use, and benzene hexachloride, toxaphene, chlordane, and TDE are examples.

Mr. Kleinfeld: I see.

Mr. Kleinfeld: If the facts which are known about chlorinated hydrocarbons, if those facts were known when they were permitted for use on crops and cattle and in dairy barns—

Dr. Bishopp: They have never been recommended for use on crops to be fed to dairy animals because we recognized from the early work with DDT that they could be, that the materials could be excreted in the milk.

Mr. Kleinfeld: On page ten of your statement, you say that "it should be pointed out that not one case of human death has been proved as due to exposure to DDT used as an insecticide." Now by exposure, do you mean effects upon people who have eaten foods containing some DDT residues?

Dr. Bishopp: That is part of it, yes. By exposure, we mean exposure in any way.

Mr. Kleinfeld: Well, in the Journal of the American Medical Association of March 10, 1951, 1 report of the Committee on Pesticides appears entitled, "Pharmacologic and Toxicologic Aspects of DDT." The report does set forth a number of cases of poisoning due to DDT exposure.

Dr. Bishopp: Due to DDT insecticides, not DDT as such, I believe.

Mr. Kleinfeld: Will you please explain that, sir?

Dr. Bishopp: In using DDT and many other insecticides, we have combinations. We must have solvents and we must have carriers, and a great many of these cases of illness have been due to the kerosene or acetone that is used for a solvent.

Mr. Kleinfeld: Aren't the solvents taken into consideration?

Dr. Bishopp: Yes, sir, they are taken into consideration, naturally.

Mr. Kleinfeld: There have been cases where people have been poisoned due to DDT substances, isn't that correct?

Dr. Bishopp: That is true of practically everything that is commonly used. Misuse results in an adverse effect.

Chairman: How many death certificates were given, that you know of, on DDT poisoning?

Dr. Bishopp: Well, I imagine five or six, or four or five, or something like that.

Chairman: Was it later determined that the cause of death was not due to DDT poisoning?

Dr. Bishopp: Many of those that were investigated by competent authorities were shown clearly not to have been DDT poisoning.

Mr. Horan: Mr. Chairman, I object to that answer. I never have heard of anyone who was killed by insecticides and I think, Mr. Chairman, that if you were to bring the Food and Drug people in here, that they would testify to that point.

Chairman: I have just asked that question and the answer was about a half dozen, approximately, deaths that were caused by them.

Mr. Horan: Deaths?

Dr. Bishopp: Due to parathion, yes, sir.

Mr. Horan: I would like to see the evidence.

Dr. Bishopp: I think—

Mr. Horan: Oh, you said parathion.

Dr. Bishopp: Yes.

Mr. Horan: Well, I agree with you. That's deadly, it is highly volatile and it is not even before the purview of this committee because as a residue it does not exist. That is not for the general public, that is a producer who is in peril there. It is not the consuming public.

Dr. Bishopp: I think we should emphasize again that so far as we are aware there is not a single instance of death that has been caused by the use of DDT as an insecticide.

Mr. Horan: Well, if it will help you any, I will drink a glassful of arsenic right here that we use for insecticides, if anybody wants to see me do it. I have probably consumed several gallons in putting it on trees.

Dr. Bishopp: We must consider dilution, of course, and most of these things when actually applied are in a dilute form and even though they may be highly toxic in a concentrated form, in the diluted form they may be perfectly safe if the proper precautions are used.

(There then followed a discussion of various aspects of toxicity.)

Mr. Kleinfeld: The general counsel for the Grocery Manufacturers of America has said that a manufacturer of a pesticide should not market it for use in food until (1) he makes an advance scientific residue determination which are required to protect both the consuming public and food manufacturers; and (2) he can provide the latter with the scientific information necessary to solve the residue problem. Do you agree with that?

Dr. Bishopp: Well, that is putting a lot of responsibility on the manufacturer. The residue problems are extremely complex. They involve, right across the board, the work of our Bureau of Entomology and Plant Quarantine. We do not want discoloring or harmful materials, and, really, to expect the manufacturer to come up with complete answers to

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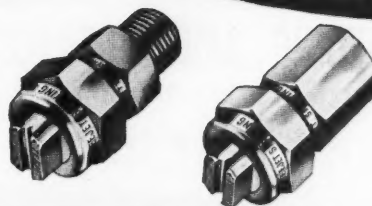
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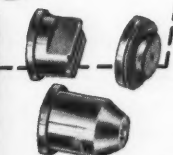
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these residue problems is indeed expecting a great deal.

Mr. Kleinfeld: Why is that true? We require the manufacturer of a new drug to give complete information to the government before it is marketed, so why is it unreasonable to require similar data from the manufacturer when poison is being used on a food product?

Dr. Bishopp: First, there is a determination as to what is the residue problem, the degree to which the public health is endangered by persistent materials that remain on crops. That, of course, is part of the work of the manufacturer. It is his determination. However, the grocery manufacturer is trying to put some of his own responsibility, I think, over on the other man. He is dodging some responsibility. The apple processors found a way of removing DDT from their apples. It took some time, and it took some work, but they say that they are not concerned about DDT residues on apples at all for processing baby foods, because they know how to take it off.

Mr. Kleinfeld: Is it incorrect that these organic insecticides reach the market for general use before adequate information is available on either the acute or chronic toxicity of the chemicals involved? Do you agree with that point?

Dr. Bishopp: I disagree with the statement that they were for general use. These recommendations are all restricted to specific crops, specific insects . . . Now, the impression seems to be that the Department of Agriculture is paying little attention to these serious problems, and I want to dispel that impression, if I can.

Chairman: I don't think that is the impression we have at all.

Dr. Bishopp: We have a group of chemists, as I said a while ago, who I think are the best chemists in the world in insecticide work, working almost day and night on the question of residues. We believe that there is need for more work and continual need for more work, but the idea that these things are turned loose on the public without any restriction is absolutely erroneous.

Mr. Kleinfeld: On page 21 of your statement you say, "Certain information on new insecticides is lacking." What kind of information is lacking?

Dr. Bishopp: Well, we might not know the effect of the material on bacteria. It is desirable to know whether insecticides are bactericides as well as insecticides. In many instances we don't go into that thoroughly. I don't like to make this statement before a Congressman, but we have been pushing rather hard to get better support of toxicological research on pesticides. We feel that we need more of that kind. We are pushing hard to get industry to put more money into the question of methods of analysis.

Mr. Kleinfeld: Is the position of your bureau different on the use of chlordane?

Dr. Bishopp: We are not, and never have recommended chlordane on food crops, nor in places where food might become contaminated. We have recommended chlordane for control of grasshoppers under certain conditions. It is used in relatively small

amounts and it is supposed to be used, for the most part, by competent people.

Mr. Kleinfeld: And you recommended it for what uses, sir?

Dr. Bishopp: It is recommended mainly for use in the control of cockroaches and ants, and those uses involve application to limited areas.

Dr. Hedrick: What effect do they have on caterpillars?

Dr. Bishopp: They are fairly effective on caterpillars, but they are not recommended on crops even though they may be devastated by caterpillars or other insects.

Mr. Kleinfeld: Does your department still recommend chlordane for use in fly control in barns?

Dr. Bishopp: It is not recommended specifically.

Dr. Knipling: We are recommending chlordane fly control in barns with the exception of inside dairy barns and milk houses.

Mr. Kleinfeld: You believe it is quite safe to permit its use in barns.

Dr. Bishopp: We recognize that chlordane is rather a poisonous material and certainly it should be handled very carefully, but applying chlordane to barns that are used for livestock other than dairy animals, the material is not generally available to the animals and we think it is safe to use it in that way.

Mr. Horan: We have established, Dr. Bishopp, that the use of insecticides is necessary. We have proved that the longevity of man has been extended because of the use of insecticides on the common housefly and on mosquitoes, and we have to use it on fruits and vegetables and other good products for production, in order to make them get crops.

I would like to know what branches of the government do conduct toxicological tests. Does the Bureau of Agricultural and Industrial Chemistry conduct any toxicological tests?

Dr. Bishopp: Yes.

Mr. Horan: Does the Bureau of Entomology and Plant Quarantine conduct toxicological tests?

Dr. Bishopp: Yes.

(Several organizations having an interest in insecticides were named.)

Dr. Hedrick: Do you believe that we have sufficient laws on the books to protect the general public against the various sprays and chemicals being used?

Dr. Bishopp: Yes, sir; in general, I think we have.

Dr. Hedrick: What effect does chlordane have on vegetation on a lawn?

Dr. Bishopp: It can be used without damage.

Dr. Hedrick: Will it injure the grass, shrubs, and so on?

Dr. Bishopp: No, not in proportions and formulations that are appropriate for that purpose.

Dr. Hedrick: Can that be bought generally through the market now, or do you have to have a special permit to use it?

Dr. Bishopp: No, it can be bought, I think, in the larger stores that handle material of that kind.

Dr. Hedrick: That is all.

(This concludes our present series on the Delaney Committee Hearings)

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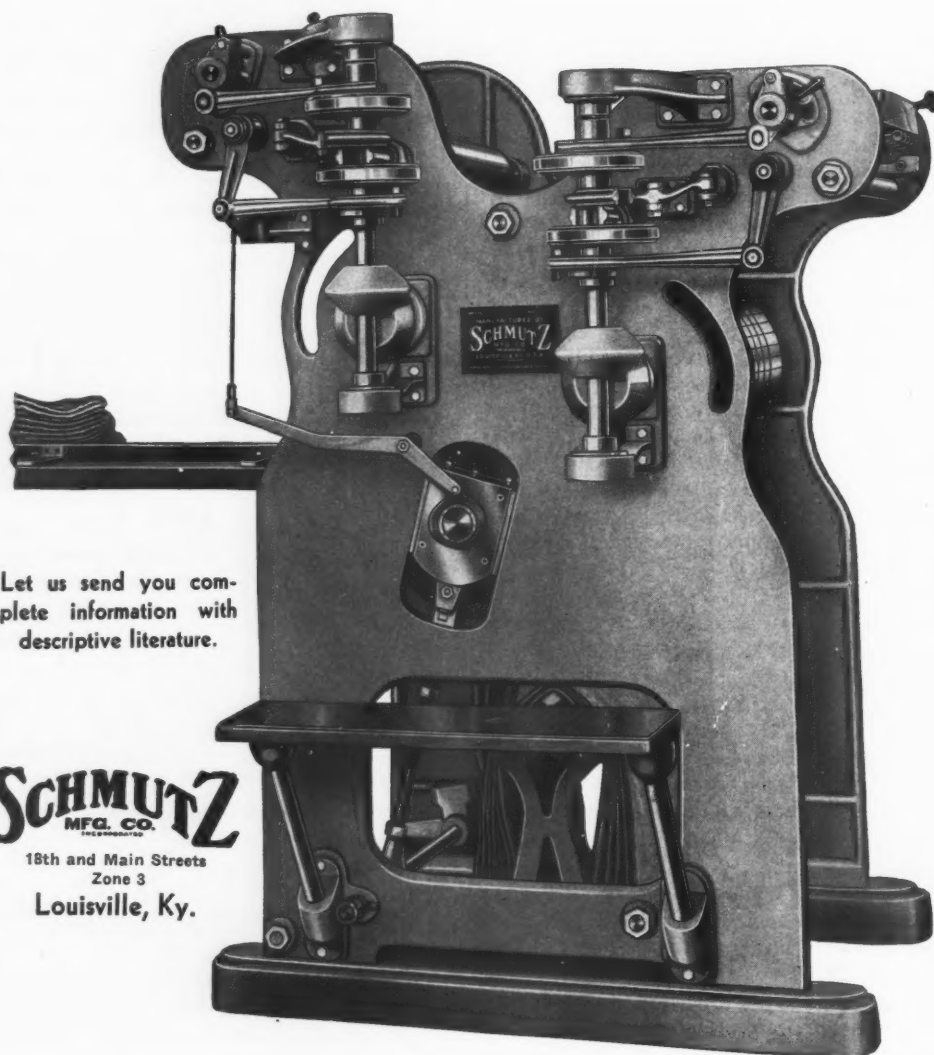
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FERTILIZER MATERIALS MARKET

New York

August 27, 1951

Sulphate of Ammonia

This material continued to be sold on a spot basis only, with no contracts being made for future and the prices ranged from \$40.00 to \$45.00 per ton according to shipping points. Demand was good, as most manufacturers are anxious to receive as much as they received last year and are willing to take it in and store it whenever it is available.

Nitrate of Soda

This market is a routine affair at the present time with normal seasonable demand and stocks adequate.

Ammonium Nitrate

Shipments are going forward against previous orders and producers are having little trouble of disposing of their entire output for the coming season.

Nitrogenous Tankage

Some domestic producers are reported sold out for the coming season and the market remains at about \$4.90 per unit of ammonia (\$5.96 per unit N). Demand continues good.

Castor Pomace

Very little of this material is available for sale due to the small production at the present time, and last sales were made on the basis of \$37.25 per ton f.o.b. Pro-

duction point in bags guaranteed minimum 6.75 per cent ammonia.

Organics

Organic materials displayed a firm tone with little change in price. Tankage and blood last sold at \$6.75 per unit of ammonia (\$8.20 per unit N), f.o.b. eastern shipping points, with most producers now asking \$7.00 (\$8.51 per unit N). Vegetable meal showed a slightly firmer tone with soybean meal for quick shipment quoted at \$67.00 per ton in bulk, f.o.b. Decatur, Ill., and new crop material offered for fall and winter shipment about \$10.00 per ton cheaper. Linseed meal was steady at prices ranging from \$57.50 to \$64.00 per ton at \$68.00 per ton in bags, f.o.b. Memphis and new crop material could be purchased for future at slightly lower prices.

Fish Meal

While some producers reported a poor catch of menhaden, other producers were said to have received a normal amount of fish so far this season and prices were steady around \$120.00 per ton for the fish meal, f.o.b. fish factories Chesapeake Bay, for prompt shipment. Some imported material was offered at slightly lower prices.

Hoof Meal

Last sales reported on the basis of \$7.25 per unit of ammonia (\$8.82 per unit N), f.o.b. Chicago,

with some imported material being offered at prices slightly under this figure. Demand is rather spotty at the moment.

Bone Meal

A steady demand is evident, particularly from the feed trade, and the market remains in a firm position with raw bone meal quoted at \$67.50 to \$70.00 per ton and steamed bone meal at about \$65.00 per ton, f.o.b. shipping points.

Superphosphate

Most manufacturers consider this material the most important material on the list for the coming season because of the sulphuric acid and sulphur situation. They expect to receive less material than they received last year.

Potash

Additional sales continue to be made of imported material because domestic producers are sold out and demand continues good in most sections.

Philadelphia

August 27, 1951

The raw materials market remains exceedingly quiet. Most things, except blood and tankage, continue to be reported tight but resale offerings do not receive much attention. It is expected that nitrogen and potash during the coming season will be in supply

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equal in tonnage to, or possibly somewhat more than, last year.

Sulphate of Ammonia.—The supply position is indicated as tight with limited offerings ranging from \$45.00 to \$60.00 per ton in bulk. In spite of the apparent scarcity, the production of coke-oven grade during the first half of this year is reported ahead of the same period last year.

Nitrate of Soda.—Demand is quite nominal and no price changes are indicated. The supply is ample with prices at \$45.00 to \$50.00 per ton in bulk, and \$48.50 to \$53.50 in bags.

Blood, Tankage, Bone.—Demand is quite weak and blood and tankage are quoted at \$6.75 to \$7.00 per unit ammonia (\$8.20 to \$8.51 per unit N). Bone meal is fairly steady at \$60.00 to \$67.50 per ton.

Castor Pomace.—While this is quoted at \$37.25 per ton, in bags, there is practically nothing obtainable on the open market.

Fish Scrap.—Market is very quiet with scrap priced at around \$110.00 and menhaden meal at \$120.00 to \$125.00 per ton.

Phosphate Rock.—Demand is fair with requirements of the acidulators contingent upon the sulphuric acid supply.

Superphosphate.—Market is firm and the supply position is definitely tight. Due to the sulphuric acid scarcity, it is fully expected that as we approach the fall mixing season the position will get much tighter.

Polash.—Deliveries on contracts continue practically on schedule although production has been cut at some plants to permit repairs. The demand is sufficiently strong to hold supply position tight.

Industry Advisor Groups

Meet with OPS Officials

Industry Advisory committees for farm chemicals in recent meetings with officials of the Office of Price Stabilization, reported to OPS that the industry can operate reasonably well under CPR 22, now due to become effective October 1, after several delays.

With 13 members present, eight of the General Pesticides Committee reported that CPR 22 would give them general price increases under the old General Ceiling Price Regulation. Five claimed either no change or mixed rollbacks and advances.

Committeemen of the Mixed Fertilizer Industry Advisory Committee request that OPS give them a tailored regulation allowing manufacturers to reflect in their ceiling prices certain cost increases beyond the cut-off dates provided in CPR 22. These included increased freight rates, cost of imported ingredients not under price control, and possible increases in the prices of their basic materials.

Members of the fertilizer committee are: Ray L. King, Georgia Fertilizer Company; J. E. Totman, Summers Fertilizer Company, Inc.; B. H. Jones, Sunland Industries, Inc.; C. D. Schallenberger, Shreveport Fertilizer Company; John A. Miller, Price Chemical Co., Inc.; Dewey K. Lange, Lange Brothers, Inc.; W. T. Wright, F. S. Royster Guano Co.; V. J. Leahy, The Baugh and Sons Co.; A. M. Eno, G. L. F. Soil Building Service;

S. L. Nevins, Mathieson Chemical Corp.; W. B. Hicks, Wilson and Toomer Fertilizer Company.

Fred S. Olmsted, Eastern States Farmers' Exchange, Inc.; J. W. Rutland, Plant Food Division, International Minerals and Chemical Corps.; C. C. Arledge, Virginia-Carolina Chemical Corp.; and Mac C. Taylor, Oregon Washington Fertilizer Co.

Pesticide manufacturers serving on the Agricultural Pesticides Industry Advisory Committee include: J. Hallam Boyd, Commercial Chemical Co.; B. P. Webster, Chipman Chemical Co.; J. V. Vernon, Niagara Chemical Division, Food Machinery Corp.; H. J. Langhorst, Insecticide Department, American Cyanamid Co.; W. W. Allen, Agricultural Chemicals Sales, The Dow Chemical Co.; E. F. Stayner, Agricultural Products Department, Shell Chemical Corp.; John A. Rodda, Insecticide Division, U. S. Industrial Chemicals.

W. Mercer Rowe, Jr., Flag Sulphur and Chemical Co.; Paul Mayfield, Naval Stores Department, Hercules Powder Co., Inc.; W. C. Bennett, Phelps-Dodge Refining Corp.; George F. Leonard, Tobacco By-Products and Chemical Corp.

W. J. Haude, Pittsburgh Agricultural Chemical Co.; Carlos Kampmeier, Agriculture Sales, Rohm and Haas Co.; Joseph Regenstein, Jr., Velsicol Corp.; John Stoddard, John Powell and Co.

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Industrial News

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National Agricultural Chemicals Association

Holding 18th Annual Meeting

LEA S. HITCHNER, executive secretary of the National Agricultural Chemicals Association, has announced that the organization will hold its 18th annual fall meeting at the Essex and Sussex Hotel in Spring Lake, N. J., September 5-7. Registration begins on Tuesday, September 4 and will continue during the morning of each day's session.

The opening session on the morning of September 5 will feature talks by prominent government officials on the relations of defense production and pesticides. In addition, reports will be given by Hitchner and the Association's president, Ernest Hart, of Niagara Chemical Div., Food Machinery Corp.

Representatives invited to speak at this session include: P. H. Groggins, Chief, Agricultural Chemicals Section, Chemical Division, NPA; T. H. McCormack, Chief, Rubber, Chemicals, and Drug Div., OPS.; H. J. Grady, Chief, Agricultural Chemicals Section, Rubber, Chemicals and Drug Div., OPS.; J. B. Taylor, Director, Office of Materials and Facilities, PMA; and W. R. Allstetter, Deputy Director, Materials and Facilities Div., PMA.

A reception for NACA members, guests, and their wives will be held on Wednesday evening.

Thursday will be devoted to association business, including the election of officers and committee meetings. Ed Phillips of the GLF Soil Building Service will preside at an open forum meeting at which opportunity will be given for discussion of association and industry problems.

In the evening, president Hart will serve as toastmaster for the annual banquet. L. Albert Woods,

president of Commercial Solvents Corp. will be the speaker.

"What Is Before Us," will be the theme of the final session on the 7th and will include a forecast of events and discussion of problems relating to pesticides in food production. Speakers will be: Dr. H. L. Haller, Ass't. Chief, BEPQ; Dr. H. E. Longenecker, Dean, Graduate School of Research in the Natural Sciences, University of Pittsburgh and Chairman of the Food Production Committee, National Research Council; Dr. F. E. Bear, Chairman, Soils Dept., Rutgers University; G. M. Oehm, Director of Public Relations, Pineapple Research Institute of Hawaii; and Jack Vernon, Vice-President, Niagara Chemicals Div., Food Machinery & Chemical Corp.

All morning sessions begin at 10 according to the program. Prizes for the annual golf tournament to be held on Thursday afternoon, will be awarded at the banquet.

Record Potash Deliveries

Potash deliveries during the second quarter of 1951 in North America hit a new high when five major American potash producers and importers shipped 863,784 tons of potash salts containing an equivalent of 490,604 tons K_2O . This represents an increase of 25 per cent over the tonnage delivered during the corresponding period in 1950.

Imports comprized 158,217 tons K_2O and include those made during the entire first half of 1951. Deliveries for agricultural purposes in the United States, Canada, Cuba, Hawaii, and Puerto Rico amounted to 816,628 tons of salts equivalent to 461,456 tons of K_2O , consisting of 419,843 tons as muriate, 1,570

tons as manure salts, and 40,043 tons as sulphate of potash and sulphate of potash-magnesia. Exports to other countries totaled 4,578 tons K_2O .

During the first six months of 1951, total North American deliveries including imports amounted to 1,490,075 tons of salts containing an equivalent of 849,054 tons K_2O . This is an increase of 34 per cent in salts and K_2O over the same period in 1950.

Deliveries of potash for agricultural use in Institute countries totaled 1,399,249 tons of salts with an equivalent of 792,971 tons of K_2O , an increase of 35 per cent in salts and 36 per cent in K_2O over last year. Making up these agricultural deliveries were 724,500 tons K_2O as muriate, 3,603 tons K_2O as manure salts, and 64,868 tons K_2O as sulphate of potash and sulphate of potash-magnesia. Exports to other countries amounted to 7,577 tons K_2O , a decrease of 19 per cent under last year.

Nitric Can Replace Some of Scarce Sulfuric Acid

Nitric acid, a relatively abundant chemical, can replace scarce sulfuric acid in processing phosphate rock for use in commercial fertilizers, according to Dr. Eugene D. Crittenden, chief of research, Nitrogen Section, The Solvay Process Division, Allied Chemical and Dye Corporation.

The shortage of sulfur and sulfuric acid is currently the most acute facing the chemical industry, chemically-based industries, and agriculture, Dr. Crittenden said.

Speaking before members of the Soil Science Society meeting at Pennsylvania State College August 27, the Solvay research chief pointed out that manufacture of nitro-phosphates is carried on today in Europe, where it has some economic advantages over manufacture of sulfur-phosphates.

"In the United States, the Ten-



Trona Muriate of Potash

This vitally important ingredient of mixed fertilizer provides the soil nutrient necessary to resist plant diseases and to enhance the productivity of crops. To obtain the best results, specify "Trona" Muriate of Potash . . . made by the pioneer producers in America.

Three Elephant Agricultural Pentahydrate Borax

Contains a minimum of 44% B_2O_3 or approximately 121% equivalent Borax. More economical in this concentrated form when used as an addition to fertilizer or for direct application to the soil, to correct a deficiency of Boron. Consult your local County Agent or State Experimental Station.



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nessee Valley Authority has done extensive pilot plant work on nitro-phosphate processes and on agronomic testing of the products," Dr. Crittenden continued. "The most successful processes studied by TVA were those using nitric acid in admixture with either sulfuric or phosphoric acid. The product, after granulation and drying, is reported to have good storage properties and to give excellent results in crop-growing tests."

Substitution of nitric for sulfuric acid will require alterations in the whole technology of superphosphate manufacture, including equipment, processing method, and product finishing steps, he warned. More extensive equipment is needed for finishing nitro-phosphate products than is ordinarily employed in producing ammoniated superphosphates or ammoniated complete fertilizers, but some of this difference may be eliminated as ammoniation rates increase.

In addition to the cost considerations, nitro-phosphate manufacture at the present time would mean diverting nitric acid away from ammonium nitrate and sodium nitrate production, he continued. However, if the sulfur shortage stimulates use of nitric acid in fertilizer manufacture, nitro-phosphate processes may undergo a period of development such as occurred in the ammoniation of superphosphates in the period from 1930 to the present.

8-1 Magnetic Separators Solve Production Problem

Farmers Guano Company, Norfolk, Va., solved a tramp iron problem by incorporating two Eriez stainless steel-faced plate-type magnetic separators in its processing lines. Previously, nails, small bolts, and other stray metal bits found their way into the finished product.

Installed in two gravity flow chutes at the discharge end of a bucket elevator, the stainless steel-faced magnets not only assure the farmer a better fertilizer, but also prevent damage to the company's mills and pulverizing equipment.

The separators are made of Alnico V, a powerful magnetic material. The units are capable of purging 35 tons of fertilizer per

hour. For more information on the Eriez magnetic separators fill out **Reader Service Card**. Ask for **8-1**.

Rock Phosphate Land is Leased by Continental

Federal leases on medium grade phosphate rock deposits in Wyoming have been obtained by the Continental Sulphur and Phosphate Company. They are co-operating with the research staff of the Natural Resources Research Institute of the University of Wyoming in trying to find practicable methods of producing superphosphates from the deposits located in sections of the Wind River Mountains south of Lander.

The company also owns large sulfur deposits near Cody which it hopes to convert to brine and might use for concentrating the Lander phosphate rock.

Strip Mine Doubles Phosphate Production

Phosphate rock production at the San Francisco Chemical Company strip mine located at Leefe, Wyoming was nearly doubled during 1950. Production during the year rose to 175,000 tons. Over half of the production went to the Pacific coast areas and over 40 per cent was shipped to the midwest.

Barnes Retires from U. S. Potash Company

Effective September 1st, J. E. Barnes, vice president in charge of sales of the United States Potash Company, is retiring from that position for reasons of health. Mr. Barnes will remain with the company as a consultant.

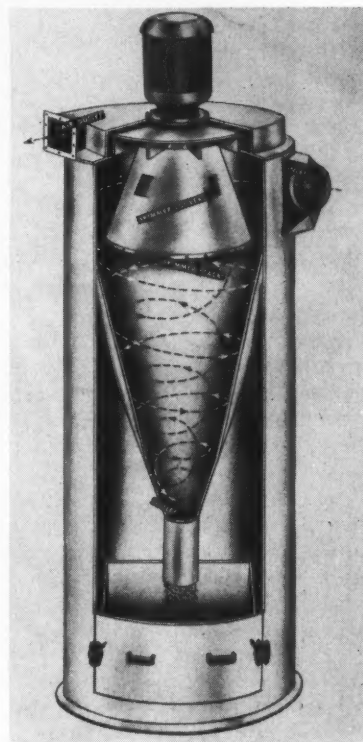
Active direction of the sales department will be in the hands of Dean R. Gidney who has been in the sales department since 1938 and has been sales manager since 1950. Mr. Gidney was graduated in 1936 from Dartmouth College where he was elected to Phi Beta Kappa.

Mr. Barnes has been with the United States Potash Company since 1940. Prior to that time he had been with F. S. Royster Guano Company. He joined the company as Manager of the Atlanta, Georgia, sales office. He was appointed sales manager and moved to the New

York office in 1943. In April 1947 he was elected Vice President in Charge of Sales, succeeding the late J. C. Devilviss.

8-2 New Unit Dust Control

Effective dust control without benefit of a central dust control unit can be achieved, it is claimed, by the employment of a new unit dust controller announced by the Day Company. Designed to be

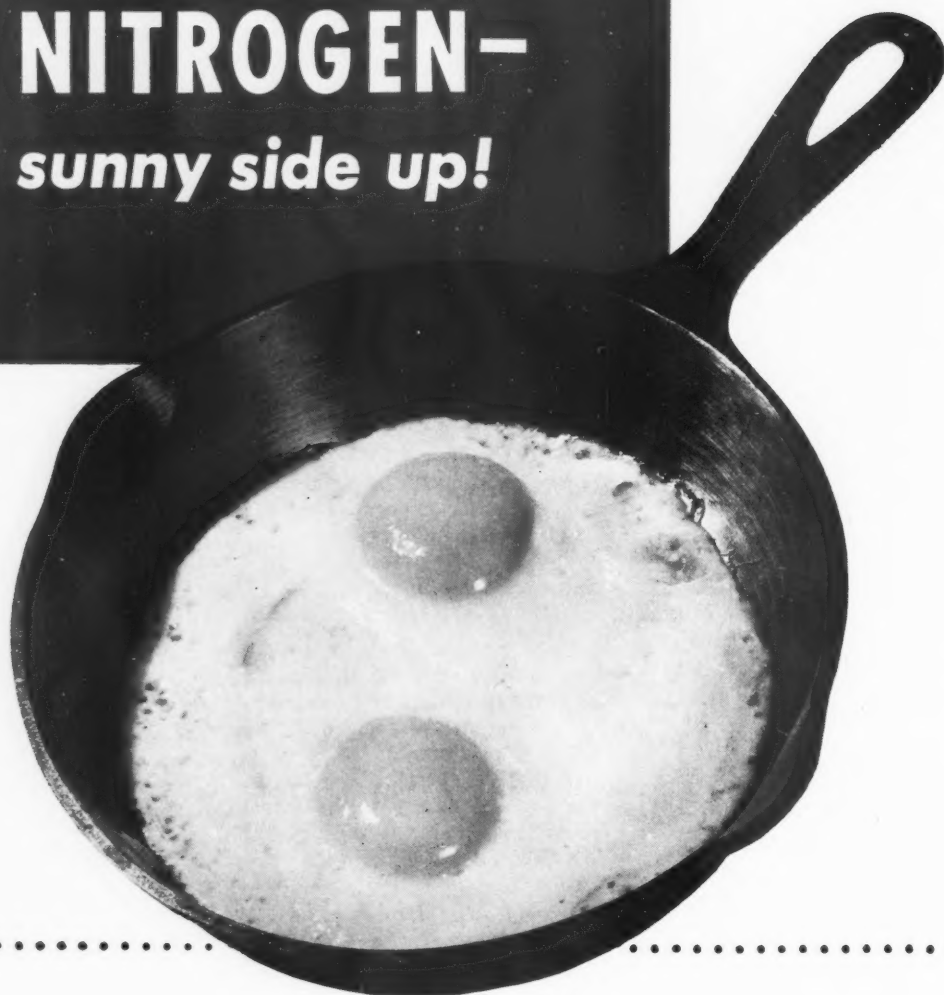


Unit Dust Control

operated as an independent unit and provide maximum dust recovery over a wide range of volume at low operating cost, the new units are said to be very practical in plants where central dust control systems are not feasible. In addition, the units solve the dust problem at dust points too far removed from a plant's central dust control system.

The unit dust collectors incorporate a dust separator and an exhaust in a self-contained, compact unit. The unit operates at 6-inches external static pressure, and the fan can be set to discharge at any 45 degree interval. Units are available in four sizes ranging from 500- to 2000-cfm., and can be furnished with or without second-

NITROGEN— *sunny side up!*



TONS and tons of corn are gobbled up each year to feed poultry and livestock—and to keep America's shopping bag filled with eggs, meat and milk. Add to this all the corn that goes to industry. How in the world can we grow so much? With nitrogen. Nitrogen helps produce more corn per acre and a higher protein yield. No single element does as much

to raise this king of crops.

Of the many sources of nitrogen, anhydrous ammonia is the most concentrated and the most economical. It is this preferred form that CSC produces at its Sterlington plant in Louisiana. Most of CSC's production goes to increase the crop yields of Gulf Coast farming land.



AGRICULTURAL DIVISION
COMMERCIAL SOLVENTS CORPORATION

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ary filters. For further information, fill 8-2 on the **Reader Service Card**.

Anderson Made Link-Belt District Manager

Link-Belt has announced that Harry G. Anderson has been appointed district manager at Birmingham, Ala., with headquarters in the Comer Building. He previously held the position of district sales engineer at Milwaukee, Wis.

Anderson attended Northwestern University, Illinois Institute of Technology, and Wisconsin University. He has served in various capacities at Link-Belt's Chicago Pershing Road plant in both the engineering department and the Chicago district sales.

Superphosphate Record Continues to Climb

Record production of 18 per cent A.P.A. superphosphate during the first five months of 1951 rose 370,000 tons above the 4.8 million tons reported for that period of 1950. Five million one hundred thousand tons were turned out, an increase of 7.7 per cent over last year.

Concentrated superphosphate production, 45 per cent A.P.A., also showed an increase with 341,000 tons manufactured from January through May of this year. This represents an increase of 50,000 tons over production for the same period last year.

Dragon Fertilizer Injector

Sprinkler systems can be made to do double duty, claims the Dragon Engineering Company. By pouring commercial fertilizer into a tank that is connected with an irrigation system an area can be fertilized as well as irrigated at the same time.

The Dragon Automatic Fertilizer Injector has a plastic lined tank with a large top opening into which the fertilizer is poured. The unit dissolves this fertilizer and feeds it into the sprinkler pipe. The unit can be adjusted to unload at any speed from 20 minutes to two hours. When not in use the injector can be left on the line without the use of a bypass.

Uniform distribution of fertilizer to any feeder root depth is reported by the firm. They also say

that the injector will fit any farm sprinkling system and may be attached at any convenient location on the line.

Sweeper Fits Ford Tractor

The new Meili-Blumberg sweeper, specially designed for use with a Ford tractor, was recently placed on the market. The broom, according to the company, is well adapted for use in industrial plants, terminals, or on docks.

It may be attached or removed within half an hour. All shafts are in ball bearings, finger tip hydraulic control raises the broom up eight inches, all moving parts are fully protected, the broom adjusts itself to the surface, and a full-length dust hood protects the operator.

Rear power take-off at a fixed ratio to engine speed is used to drive the broom and this provides efficient sweeping at all tractor speeds. The device will sweep a five-foot area at a 30-degree angle, depositing debris to the side of the tractor wheels. Fibre or steel brushes are available.

Potash Company Has Moved Sales Office

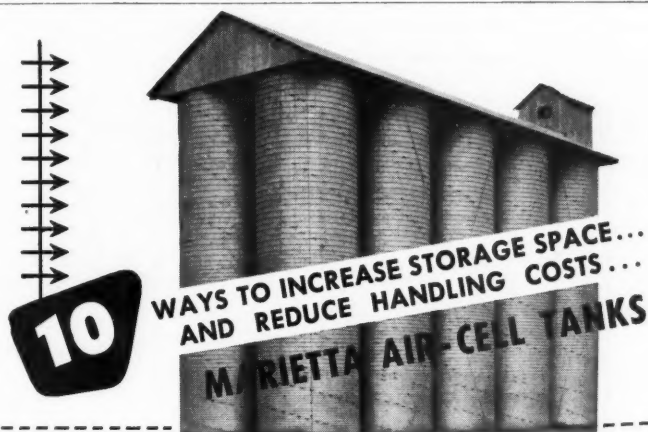
Potash Company of America has moved its General Sales Office to Washington, D. C. George E. Pettitt, Vice President and General Sales Manager, has announced that quarters have been leased in the newly erected Cafritz Building at 1625 Eye Street, N. W.

Offices at 50 Broadway in New York City have been given up.

Aries Purchases Agnew Consulting Business

Acquisition of the business of William Y. Agnew has expanded the scope of activities of R. S. Aries & Associates, consulting chemical engineers in New York. Agnew, a consulting chemical engineer of New York City has worked in pigments, fertilizers and engineering design.

The general engineering and drafting offices of the acquired firm will remain at 500 Fifth Avenue but the executive offices will be transferred to the parent company at 400 Madison Avenue.



These 10 Marietta Air-Cell tanks at North Little Rock, Arkansas, were custom built to provide dependable, year 'round safe storage at low handling costs.

Our engineers and erection specialists can design and erect a complete storage system to give you this same kind of permanent storage space, when and where you want it.

Marietta tanks keep your fertilizers moisture-free—BONE DRY—protected from spoilage and the elements. Constructed of Air-Cell lightweight concrete staves, Marietta tanks are built to last—to give you wind and fire proof protection—lower insurance rates and eliminate maintenance problems.

For full details write or wire our nearest office—ask for Bulletin 1815.

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MONARCH SPRAYS



This is our Fig. 645 Nozzle. Used for Scrubbing Acid Phosphate Gases. Made for "full" or "hollow" cone in brass and "Everdur." We also make "Non-Clog" Nozzles in Brass and Steel, and

Stoneware Chamber Sprays now used by nearly all chamber spray sulphuric acid plants.

CATALOG 6-C

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Use this Hayward Class "K" Clam Shell for severe superphosphate digging and handling.
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ATLANTA UTILITY WORKS

EAST POINT, GA.

as has been obtained in laboratory experiments, will be tried under field conditions for the first time this summer.

Link-Belt Increases

Its Plant Facilities

Link-Belt Company has started construction of a modern engineering and manufacturing plant for the production of elevating, conveying and processing machinery. The plant, located on a 43-acre site at Colmar, Montgomery County, Pa., will contain approximately 300,000 sq. ft. of floor space, including a two-story office building and a modern cafeteria. The layout allows for future expansion to double initial size.

Keim Moves Office

Myron M. Keim, agronomist for the Virginia-Carolina Chemical Corporation, has been transferred to the company's home office in Richmond, Virginia. Formerly of East St. Louis, Illinois, Keim will continue to handle agronomic work for the midwest area and also for the areas covered by V-C offices at

Baltimore, Md.; Carteret, N. J.; Norfolk and Richmond, Va.

Frank E. Boyd, agronomist for the corporation in Montgomery, Ala., will continue to handle agronomic work for the southern area.

Schramm Market Research

Head at Spencer

The Spencer Chemical Company, of Kansas City, Mo., has announced the appointment of Robert W. Schramm as manager, Market Research Section.

Mr. Schramm joined Spencer Chemical Company in January, 1949, as a market analyst and was advanced to Market Analyst in Charge of Industrial Chemicals. Prior to this, he was connected with Carbide and Carbon Chemical Corporation, Whiting, Ind. He is a graduate of the University of Notre Dame and the University of Indiana, Bloomington, Ind.

Jefferson Lake Steps Up

Production of Sulphur

Jefferson Lake Sulphur Company, New Orleans, La., has begun production operations of sulphur at its Stark's Dome property in Cal-

casieu Parish, La., Eugene H. Walet, Jr., revealed recently. "This property," Mr. Walet stated, "substantially increases the reserves and the number of tons of sulphur produced by the company annually." Earlier this year Jefferson Lake reported that it expected to bring in production at the rate of 100,000 tons of sulphur annually.

Bours Named to Dupont

Organics Department

William A. Bours III was recently named manager of the Plants Development Section of the Du Pont Company's Organic Chemicals Department. Mr. Bours succeeds Dr. George E. Holbrook who has become assistant director of the Du Pont Development Department.

Mr. Bours started with Du Pont ten years ago as an industrial engineer in the Engineering Department soon after he was graduated from Columbia University. He had received the bachelor of arts degree in chemistry at Princeton in 1939 and the bachelor of science degree in chemical engineering there in 1940.

For "high-nitrogen" fertilizer... use Koppers Ammonium Sulphate!

- Koppers offers a good commercial grade of ammonium sulphate—the ingredient that is so essential to fertilizer because of its high nitrogen content.

KOPPERS COMPANY, INC.
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CHARACTERISTICS

Koppers Ammonium Sulphate comes in crystals with low free-acid and moisture content. The nitrogen content is guaranteed to be not less than 20.5%.

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From St. Paul, Minn. and Kearny, N. J., Koppers Ammonium Sulphate is shipped in 100 lb. and 200 lb. bags—also in boxcars and trucks. From Granite City, Ill. and Midland, Pa., it is shipped only in boxcars and trucks.

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Unexcelled for its superior Dehydrating, Neutralizing, and Curing factors in the preparation of better fertilizers. Write for complete information.

PROMPT SHIPMENTS

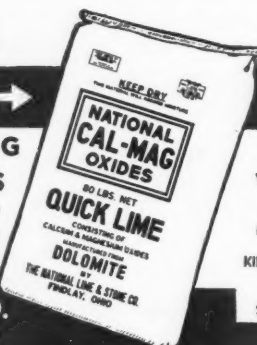
Three railroads serve our Carey, Ohio plant--assuring prompt delivery--everywhere.

CAL-MAG OXIDES

MgO 40.39

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DOLOMITIC
HYDRATED
LIME (165 TNP)
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KILN DRIED RAW
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the number of pounds of raw material for a desired per cent. of plant food in a ton of mixed goods—or find what per cent. of a certain plant food in a ton of fertilizer produced by a specific quantity of raw materials.

No mathematical calculations are necessary. You can find the figures in a few seconds with the aid of

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To make clearer its use, answers to such problems as the following can be quickly obtained:

How much sulphate of ammonia, containing 20 per cent. of nitrogen, would be needed to give $4\frac{1}{2}$ per cent. nitrogen in the finished product?

Seven hundred and fifty pounds of tankage, containing 8 per cent. phosphoric acid are being used in a mixture. What per cent. of phosphoric acid will this supply in the finished goods?

Should the Adams' Formula Rule become soiled from handling, it may be readily cleaned with a damp cloth.

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One of the foremost producers of Agricultural Chemicals and soluble mineral salts.

The Tennessee Corporation is one of the oldest suppliers of Mineral Salts. We are in a position to supply large or small orders of various mineral salts.

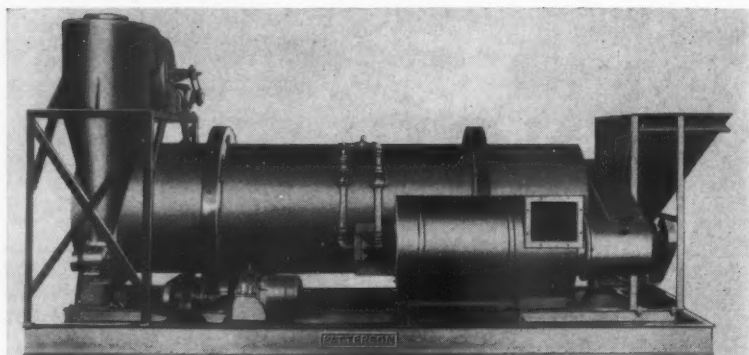
- ★ MANGANESE SULPHATE
- ★ ZINC SULPHATE
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- ★ COPPER CARBONATE

Sulphur Dioxide—Many users of Sulphur are finding that Sulphur Dioxide can be economically substituted for sulphur. Many industries have made this conversion. We are in a position to supply Sulphur Dioxide in cylinders, drums and tank cars. One of our representatives will be glad to consult with you—at no obligation to you.

Write, wire or phone the Tennessee Corp.,
Grant Building, Atlanta, Ga.

TENNESSEE TC CORPORATION
Atlanta, Georgia Memphis, Tennessee London, Ohio

8-3 Packaged Drying Unit



Patterson Packaged Chemical-Dryer

A packaged drying unit has been developed by the Patterson Foundry & Machine Co. for the drying of chemical products. The unit consists of a rotary dryer with drive, screw feeder, air heater, fan, dust collector integrally mounted on a steel frame.

Materials to be dried are fed continuously, by means of a special feeder, directly to the interior of the dryer. To maintain optimum drying conditions, the unit is

equipped with a drive permitting variation of the feed rate over a range of 3 to 1.

Pre-heated air is provided by an oil or gas fired air heater, and steam may also be used. The dryer is equipped with automatic thermostatic control. There is no recycle of the dryer air, fresh air is drawn in for the full make-up.

The unit is constructed in a number of standard sizes, and it is available in plain or stainless steel.

Davison Safety Awards

The Davison Chemical Corporation was recently awarded 22 safety awards, including the first one of its kind to a chemical company in Maryland for an outstanding safety record during the past year.

The National Safety Council has informed Davison that its corporate-wide safety record for 1950 has earned the Council's Distinguished Service to Safety Award. Davison was the first company of its size to win this award in the state since the prizes were inaugurated in 1942.

The Council's award was reflected in the national safety record of Davison as confirmed by the presentation to units within the company of 18 "Certificates of Achievement" from the Manufacturing Chemists' Association and three "Certificates of Honor" from the Joseph A. Holmes Safety Association.

Louis J. Evens Joins Fulton

Fulton Bag and Cotton Mills announces the addition of Louis J. Evens to its sales staff in New Orleans. Mr. Evens is a native of New Orleans and has been con-

nected with the bag industry for many years. He has served with several different companies and for the last thirteen years was with Bannon Bag Company, until its recent withdrawal from the industry. He has traveled extensively through the South and Mid-West and has a wide acquaintance in the trade. His friends and customers will be glad to know that his long experience will still be available as he will continue to serve them through Fulton Bag and Cotton Mills.

Entomologist Joins Julius

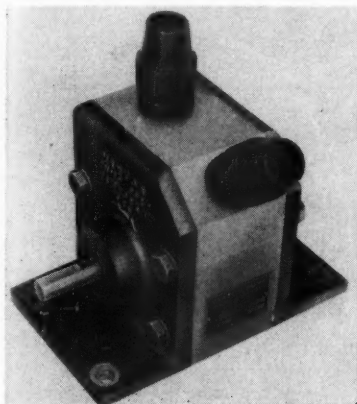
Hyman at Denver

Frederic J. Luthi, entomologist, has joined the staff of Julius Hyman & Company, chemical manufacturers, Denver, Colorado, where his duties will consist of technical development and sales promotion work with emphasis upon European and African markets. Mr. Luthi, formerly with the Geigy Company, has been closely identified with agricultural problems and chemicals since his graduation from Federal Polytechnic School in Zurich, Switzerland, in 1932.

FARM CHEMICALS

8-4 Plastic Lined Pump

A new series of non-corrosive and non-contaminating "flex-i-liner" pumps is being marketed by the Vanton Pump Corp. In the new P series pumps, the fluid being transferred comes in contact only with a polyethylene body block and a vinyl "flex-i-liner."



Corrosion Resistant Pump

The pump withstands corrosive actions of acids such as sulfuric, hydrochloric, nitric, and hydrofluoric, as well as caustics and other chemicals to which polyethylene and vinyl are resistant. The design has eliminated stuffing boxes, packing glands, shaft seals, check valves, and gaskets.

An eccentric rotor mounted on a sealed-in ball bearing rides inside and activates the molded vinyl "flex-i-liner," creating a squeegee action between the outside of the "flex-i-liner" and the inside of the body block.

In addition of polyethylene, other standard pump body blocks may be obtained in bakelite or bakelite with graphite filler. "Flex-i-liners" are available in natural rubber, pure gum rubber, hycar, perbunam and neoprene in addition to vinyl.

At present, P series pumps are available in capacities ranging from fractional to 5 gpm. Terminals are either drilled and tapped, supplied with standard saran tubing fittings, or hose connections. The pump requires $\frac{1}{4}$ -hp. motor and can be furnished either alone or completely mounted and connected to constant or variable speed drives. Data can be obtained by filling in the **Reader Service Card**. Ask for 8-4.

AUGUST, 1951

New Sales Manager at International Minerals

S. T. Keel has been appointed domestic sales manager of the Phosphate Division of International Minerals & Chemical Corporation. His headquarters will be in the Chicago offices of the corporation. Keel has been manager of the southern district of the phosphate sales department for the past four years and has been with International over 10 years.

R. H. Linderman, former northern district sales manager, has been transferred to Atlanta, Ga., as sales manager of the southern district.

Shell Expands Nitrogen Capacity with New Plant

Shell Chemical Corporation will add a new synthetic ammonia plant to its other petrochemical manufacturing units at Dominguez, California. The new plant near Los Angeles will supply nitrogen fertilizer to the farmers of Arizona, California, Oregon and Washington.

Raw material for the synthesis reaction will be natural gas and air. Construction of the multi-million dollar plant will begin this year with completion scheduled for late in 1952.

Certified as a necessary defense unit by the Federal Government because of its tremendous effect in boosting production of foodstuffs, the plant will also produce ammonia for the manufacture of munitions, nitric acid, commercial explosives, paper pulp and other industrial needs.

Sulfur Recovery

In spite of the current sulfur shortage, Dr. Clyde Williams, Director of Battelle Institute, Columbus, Ohio, optimistically estimates that about 3 million tons of sulfur, other than native Gulf Coast sulfur, could be economically recovered annually by present processes. He comments "unprecedented demand for sulfur both here and abroad, plus limitations on the major source of supply, have created the present shortage. Fortunately, however, already available technological processes make possible increased supplies of this basic

Your partners

are the farm families throughout the nation who buy your products. Many of their production needs are closely related to yours.

Their success in meeting this year's greatly increased food and fiber goals depends to a large extent upon your ability to manufacture and distribute essential supplies of fertilizers and pesticides.

Farm organization leaders, along with their experienced Washington staffs, are constantly presenting factual data on farm operations to key Congressional and Government officials.

Mounting defense production problems clearly show the need for close liaison between leaders in both groups.

It is apparent that you will both make a greater contribution toward a stronger America with a full breadbasket by . . . working together as partners.

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1 AMMONIUM SULFATE

Phillips 66 Ammonium Sulfate is a free-flowing 21% nitrogen material! Mixes easily! Uniform crystals resist caking! Ideal for high analysis mixed goods! A fine direct application material, too!

2 AMMONIUM NITRATE

Phillips 66 Prilled Ammonium Nitrate contains 33% nitrogen. The small, coated prills or pellets resist caking . . . handle easily. Depend on Phillips 66 Prilled Ammonium Nitrate for uniform, free-flowing properties and top-notch crop response.

3 NITROGEN SOLUTIONS

Get more N per dollar! Phillips 66 Nitrogen Solutions are well suited to the preparation of high-analysis fertilizers and the ammoniation of superphosphate. These three nitrogen solutions keep handling costs low! Promote rapid, thorough curing!

4 ANHYDROUS AMMONIA

Tank car shipments of Anhydrous Ammonia (82% nitrogen) are supplied to Phillips contract customers from Phillips huge production facilities in the Texas Panhandle. Write our nearest district office for full information.

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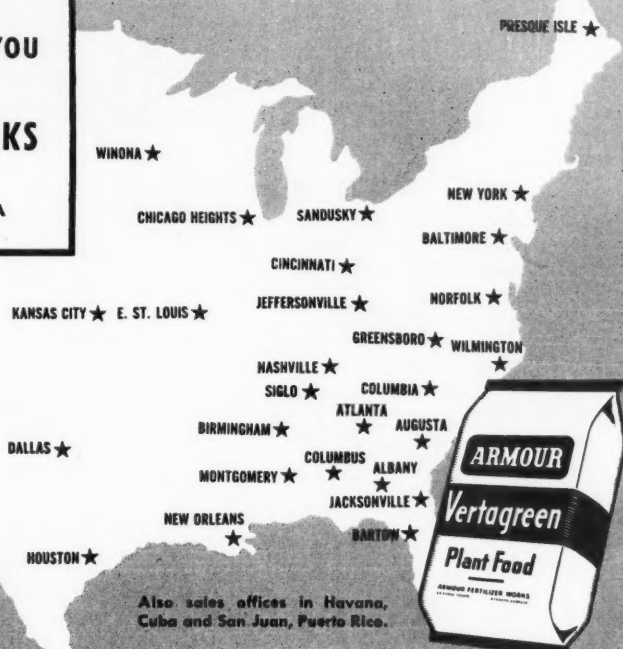
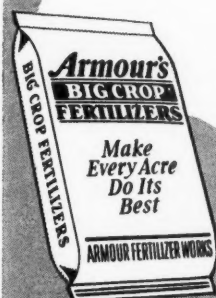
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CORPORATION**

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Georgia
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That is why YOU can depend on KRAFT BAGS!



Send your product to market in a "KRAFT BAG" — the container for a 1000 uses!

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How You Can Get

Free Information

On each of the two postage-paid postcards below you can request further information on four items described on this and the Industrial News section of this issue. Fill out one quarter section for each item in which you are interested.

8-5 Save Conveyor Belts

Stephens-Adamson Manufacturing Company has released a manual, entitled, "Save Your Conveyor Belts," which discusses the company's Spring-Type Conveyor Belt Cleaner.

The manual contains photographs, diagrams, and literature describing the use and operation of the Conveyor Belt Cleaner along with necessary statistical information.

8-6 Check-Weight Scale

Thayer Scale and Engineering Corporation has issued a booklet entitled, "It Pays To Be Sure," which contains complete information on the Thayer Scale Model 200, for checking weights of packages.

Dimensions, weight, capacity, speed, tolerances, feed roller, levers, accuracy, and guarantee of the machine are all contained in the booklet.

8-7 EPN Manual

A new technical manual on "EPN", the new duPont developed pesticide for mite control in deciduous fruit orchards, has been released by that company.

The manual lists the major insect pests against which EPN is effective. Also, a group of other insects are listed along with experimental data indicating results with EPN in initial investigations.

Here is a list of the **NEW PRODUCTS** and **BULLETINS** described on this and the Industrial News pages of this issue giving their monthly code number.

- 8-1 Magnetic Separators
- 8-2 Plastic Lined Pump
- 8-3 Packaged Drying Unit
- 8-4 New Unit Dust Control
- 8-5 Save Conveyor Belts
- 8-6 Check-Weight Scale
- 8-7 EPN Manual
- 8-8 Packaged Uni-Blenders
- 8-9 Flow-Ratio Controls
- 8-10 Handling System
- 8-11 Yard King Gas Truck
- 8-12 Toxaphene Uses
- 8-13 Portable Conveyors
- 8-14 Orthodichlorobenzene
- 8-15 Vibrating Screens
- 8-16 Aldrin Data
- 8-17 Safety Equipment
- 8-18 Dust Control and Collection
- 8-19 Truck Attachment

FILL OUT READER SERVICE CARDS

Name 51 Title Company Co. Address <small>Write in the number of the product about which you want more information</small> FARM CHEMICALS PHILADELPHIA 7, PA.	Name 51 Title Company Co. Address <small>Write in the number of the product about which you want more information</small> FARM CHEMICALS PHILADELPHIA 7, PA.
Name 51 Title Company Co. Address <small>Write in the number of the product about which you want more information</small> FARM CHEMICALS PHILADELPHIA 7, PA.	Name 51 Title Company Co. Address <small>Write in the number of the product about which you want more information</small> FARM CHEMICALS PHILADELPHIA 7, PA.
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8-8 Packaged Uni-Blenders

A. E. Poulsen & Company has released a manual entitled, "R. T. R.—Ready to Run Uni-Blender," which contains complete information on the various types of Poulsen Uni-Blenders.

The construction, installation, operation, and production of the units are discussed and photographs of the equipment are also included.

8-9 Flow-Ratio Controls

Fischer & Porter Company has released a new catalog entitled, "Ratio-Ratio Flow Ratio Controllers", describing the features of the company's Automatic Flow Ratio Control Systems.

The principle of operation along with the fundamental reasons for improved ratio control are described in the catalog. A list of applications and diagrams are included.

8-10 Handling System

J. C. Corrigan Company, Inc., has released a manual on "Corrigan Conveyors," which describes through the use of photographs and explanation how a dependable handling system can increase production and cut operating cost. Various sections of Corrigan con-

veyors in operation are shown in the manual.

8-11 Yard King Gas Truck

The Yale & Towne Manufacturing Company has released a manual entitled, "Yale Yard King '40' Gas Truck," which offers complete statistical information on the gas truck.

Charts, diagrams, and information concerning capacity, weight, speeds, dimensions, steering, hydraulic controls, and other general information are contained in the manual.

8-12 Toxaphene Uses

Hercules Powder Company has issued a booklet entitled, "More Profit Per Acre Through Insect Control with Toxaphene Dusts and Sprays."

The booklet contains information concerning the uses of toxaphene insecticides and their effectiveness in various situations. Methods of proper application and most effective amounts of the chemical to use are discussed in the bulletin.

8-13 Portable Conveyors

Lake Shore Engineering Company, has released a 12-page illustrated bulle-

tin entitled, "Lake Shore Coal and Material Handling Equipment."

The new bulletin describes the company's complete line of flight and belt type portable conveyors and under unloaders for handling fertilizers, coal, sand, lime, and other bulk materials.

8-14 Orthodichlorobenzene

Monsanto Chemical Company has available a booklet entitled, "Monsanto Orthodichlorobenzene for Chemical Processing & Consumer Products Industries."

The booklet discusses the versatility of the chemical and its wide range of chemical and physical properties. Its effectiveness as a weed killer, insecticide, soil disinfectant, and commercial solvent are explained in the booklet.

8-15 Vibrating Screens

A 20-page illustrated manual on Line Belt Vibrating Screens (Book No. 237) has just been issued by the company.

The manual contains specific information on how to select the right screen and screen cloth for top operating efficiency; weights, dimension tables, horsepower requirements; and other information valuable to the engineer and plant operator.

8-16 Aldrin Data

Julius Hyman & Company has recently issued a booklet, "General Information on Experimental Use of Aldrin for Agricultural Insect Control."

The booklet contains a list of pertinent questions and answers concerning the use, potency, safety, effectiveness and applicability of the insecticide.

8-17 Safety Equipment

The Willson Company has issued a new catalog entitled, "Willson for Industrial Safety," which contains complete product information, with photographs and illustrations, on the company's eye and respiratory safety equipment.

Selector tables containing detailed information on the products are also offered in the catalog.

8-18 Dust Control and Collection

Dust control through exhaust systems is the subject of an extensive book published by the Pangborn Corporation. The booklet is not an engineering treatise on the subject of industrial dust control but is intended as a general description of the means by which industrial dust may be controlled at the source of production. Prepared especially, says the company, for plant executives interested in the methods and equipment utilized for solving dust control and collection problems.

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industrial material. These processes will enable greater production from up-to-now unexploited sources. In addition, some users now may begin to conserve sulfur that is presently wasted."

Actually, less than one-third of this potentially recoverable sulfur was produced in 1950, Dr. Williams pointed out. As in past years, cheap native sulfur mined in the Gulf Coast area has made production from other sources, for the most part uneconomical. The present shortage of low-priced native sulfur and its consequently rising price is tending to bring previously unexploited sources into operation.

Dr. Williams said that whatever direction adjustments may take, ample supplies of sulfur are in sight. Production of native sulfur from the Gulf Coast area, almost 5 million tons in 1950, will probably stay at that record level for a number of years. Meanwhile, greater production from other sources, at a price, should take up the slack to meet the expanding needs of industry.

International Minerals Increases Texas Plant

International Minerals & Chemicals Corporation has announced the completion of a plant food mixing building, two buildings for bulk storage of superphosphate, a warehouse for bags and a locker building, which, together with a shop and tractor garage that is not yet completed, will increase the capacity of International's Texarkana operation about 50 per cent. In addition to the new buildings, the Texarkana plant consists of a superphosphate manufacturing plant, a finished goods warehouse, anhydrous ammonia storage tanks, and an office building.

Rock Salt Added to Soil Boosts Crop Yield

Use of coarse rock salt as an additive fertilizer for sugar beets, canning beets, celery, and cotton substantially increases the yields of those crops, according to the International Salt Company, Inc. Although other research workers had previously shown the value of salt as a fertilizer for these crops, recent experimental work has established the fact that sodium is essential for

maximum growth and quality of beets and celery. Research at Mississippi State College has shown that the yield of cotton per acre can be substantially increased by adding sodium to the soil. For fertilizer purposes this sodium is supplied economically and conveniently in the form of coarse rock salt, the company pointed out.

Research at the University of Wisconsin established the fact that, even when adequate amounts of available potash are present in the soil, use of rock salt will increase yields of beets and celery. When the available potash supply is not adequate, the experiments showed that the application of sodium chloride (rock salt) will offset this deficiency to a certain extent with beets and celery and possibly also with potatoes, carrots and some other root crops. Salt has been known to produce one extra pound of sugar for each pound of salt used on beets.

The tests conducted at the University of Mississippi demonstrated that the addition of about 120 pounds of salt per acre increases cotton yields, and, in addition, proved that sodium in the form of salt can "be expected to replace potash to the extent of one-fourth of the potash requirement for cotton." For further information see "Sodium as a Fertilizer," American Fertilizer & Allied Chemicals, January, 1951.

Cyanamid Consolidates Offices, Warehouses

American Cyanamid Company has consolidated its several office and warehouse locations in Chicago, Illinois and St. Louis, Missouri into one newly constructed building in each city.

The new office and warehouse buildings will permit the company to keep on hand larger quantities of its wide range of chemical products, including fertilizers, weed killers and insecticides. With the new buildings in operation, the numerous functions performed by the previous locations will be handled by one staff under one roof in each city.

The Chicago building, a two-story structure with 100,000 square feet of floor space, occupies a site in the Addison-Kimball district sufficiently large to permit future

expansion. The building will be served by switchtrack and is located far from the congested business district. The St. Louis Building is a one-story 30,000 square foot structure.

Both buildings are air conditioned in office, laboratory and certain storage areas and have special refrigeration equipment for pharmaceuticals, antibiotics and biologicals.

The two moves are part of an over-all company plan which calls for similar consolidations in other major cities of the United States and Canada.

Kraft Paper Ceiling Prices Proposed by Industry

Members of the Kraft Paper Industry Advisory Committee at their second meeting with OPS officials made detailed recommendations on the proposed provisions of a tailored regulation for their industry which would fix dollars and cents ceiling prices on seven key grades of unbleached kraft paper manufactured in integrated mills in the South and West.

The dollars and cents ceilings would apply to about 60 per cent of the unbleached kraft paper produced in the country. Other grades made by these mills, amounting to another 20 per cent of the nation's total production, would be determined by differentials from key grades. Historic differentials would also apply to special size rolls and sheets, variations in weight, colors, packaging and small lots.

Under the proposed regulation integrated manufacturers in the Northeast and Lake states, who make about 6 per cent of the total production of unbleached kraft paper, would employ as their ceilings the ceilings they had in effect on a specified date, possibly at the level under the General Ceiling Price Regulation, GCPR. These mills mostly produce high grades of specification papers at premium prices.

Integrated mills are those mills which manufacture both unbleached kraft pulp and paper, and account for 86 per cent of the total national production of kraft paper.

The balance of 14 per cent is produced in non-integrated or converter mills, whose costs tend to be higher because they must purchase

market pulp. Under the proposed regulation ceiling prices of non-integrated manufacturers of unbleached kraft paper might be fixed at the level of the Manufacturers' General Ceiling Price Regulation, CPR 22.

The different pricing devices for different segments of the industry were proposed because of the peculiar character of the industry. Mills in the South and West generally are low cost mills operating with modern equipment where pulpwood is abundant. To meet the competition of the low cost mills in the South and West, Northeast manufacturers have tended to specialize in quality and specification papers. The converter mills, moreover, could not operate profitably at ceilings which would be adequate for the integrated mills.

The key grades on which it is proposed to spell out ceilings are: Wrapping paper, counter rolls.

Butchers paper, counter rolls.

Grocers and variety bag paper, mill rolls.

Shipping sack paper, mill rolls.

Gumming paper, mill rolls.

Envelope paper, mill rolls.

The proposed prices discussed for these key grades were weighted averages of GCPR prices, which means that the regulation might retain GCPR ceilings for almost 90 per cent of the unbleached kraft paper industry.

Unbleached kraft paper is defined as any paper of G.E. brightness of less than 35, containing 75 per cent or more of unbleached kraft sulphate fibre in basis weights of 18 pounds or more. The South and West are described as all areas south of Ohio and all territory west of the Rockies.

Market Research Group

The creation of a new group to conduct market development in industrial chemicals and the reorganization of the Technical Service Division is now being undertaken by the Commercial Solvents Corporation. The changes are designed to strengthen the company's sales organization and to provide more efficient service to customers.

Special projects relating to the development of markets for both new products and established products of the Industrial Chemicals

Division have been assigned to the Market Development group. Presently underway is a market survey on the nitroparaffins and their derivatives based on low projected selling prices reflecting economies resulting from process improvements and contemplated large scale production.

Dr. Frank E. Dolian, formerly Assistant Manager of the Technical Service Division, has been appointed Manager of the Market Development group. Assigned to his staff are the following personnel, previously in the Technical Service Division: Kenneth W. Bayha, San Francisco; A. Mosher Cooke, Boston; Walter C. Gwinner, New York, and Louis L. Hallock, of the Terre Haute office.

Deficiency Letterheads

The re-printing of deficiency-symptom photographs in color is now being conducted by the Committee on Fertilizers of the Soil Science Society of America. The stationery may be personalized by the printing of an individual letterhead, thus increasing the attractiveness and educational value of the letter. The stationery without letterhead imprinted is available for purchase by individuals or groups.

New Paper Coating

After spending three years and almost a million dollars on research, the Du Pont Company, it was announced, has developed a new and economical way to add its synthetic rubber, neoprene, to paper.

Instead of coating or saturating the finished paper, as in older methods, the neoprene is now added in latex form to the pulp just before it is made into paper. The result is a new family of low-cost specialty papers made directly on the paper machine.

Outstanding advantages of the new papers are said to be wet strength, chemical resistance, and all-around improvement in physical properties. These properties will give rise to superior paper products of many kinds, the company said.

One manufacturer of plastic install-it-yourself wall tile has replaced the ordinary backing material, asphalt saturated paper, with neoprene treated paper to

make it more pliable and easier to install in cold weather, and to eliminate the danger of smudging walls during installation.

In the industrial field neoprene treated paper has undergone successful field trials in such applications as gasket paper, multiwall bag paper, wrapping paper, box board, and industrial filter paper.

Du Pont announced that it will not itself manufacture any of these papers—its role will be to supply neoprene latex and technical assistance to the paper industry.

New Chlorine Facilities

Announced by Solvay

The Solvay Process Division of the Allied Chemical & Dye Corporation, announced recently that it will shortly begin construction of a new mercury cell chlorine-caustic soda unit at its plant near Syracuse, New York. The new plant will involve an expenditure in the order of \$10,000,000 and will about double capacity of Solvay's chlorine-producing facilities at Syracuse. It is estimated that 18 months to two years may be required to complete the project.

Solvay produces chlorine at its Baton Rouge, Louisiana; Huntsville, Alabama; and Hopewell, Virginia, plants as well as at Syracuse. Recently Solvay announced expansion of its Hopewell, Virginia, chlorine plant, in which a new chemical process developed by Solvay research will be employed.

Kolker Purchased

Diamond Alkali Company and the Kolker Chemical Works, Inc., have announced that Diamond has made arrangements to obtain all the common capital stock of Kolker in exchange for 33,500 shares of Diamond's common stock. The action is subject to approval by Diamond shareholders at a special meeting scheduled for August 30.

Diamond operates 12 plants and its present annual sales are at the rate of \$75,000,000. Kolker manufactures a line of organic pesticide materials with present sales of \$7,000,000 a year. No change in the management of Kolker is contemplated.

Safety Manual Off Press

Practical ways to prevent industrial accidents and fires are

FARM CHEMICALS

contained in the new edition of the National Safety Council's 800-page, "Accident Prevention Manual for Industrial Operations." Detailed description and price may be obtained by writing the National Safety Council, 425 North Michigan Avenue, Chicago 11, Ill.

Donald Promoted by Lion

Leroy Donald has been promoted to the newly created position of sales manager for the Chemical Division of Lion Oil Company, according to an announcement made by A. Frank Reed, vice-president in charge of sales. Donald, who became associated with Lion Oil in June, 1948, as chief agronomist, has been Reed's administrative assistant in chemical sales since September, 1949.

Simms Joins Thurston Staff

Robert C. Simms, formerly associated with the Naco Fertilizer Company, has been appointed assistant to the president of Thurston Chemical Company. W. R. Thurston, president of the Missouri concern, said that Simms will be assigned to duties created by

company expansion, regulations concerning allocations, and pricing.

Conserve Bags Urges U.S.D.A.

Conservation and maximum re-use of burlap and cotton bags and other products made from these materials, to help offset an expected tight supply situation, has been urged by USDA.

The Office of Materials and Facilities in the Department's Production and Marketing Administration, which maintains a check on the facilities needed for maximum food and fiber production, reports that the supplies of burlap and cotton for these uses is likely to be increasingly tight. On the basis of experience in World War II, the demand for burlap and cotton can be expected to increase substantially during the present defense emergency. At the same time, the current outlook is for greater difficulties in getting burlap from abroad, and this will put greater pressure on available cotton supplies to meet all defense requirements.

Specific suggestions for users of burlap and cotton bags include the following:

Keep bags in use. If they are not needed, see that they are gotten back into trade channels by returning them to feed dealers and other users, or to reliable bag dealers.

Handle bags carefully. Don't throw them down in the feed lot or leave them outside in rain or snow. Open bags carefully. Don't rip them open with a knife.

Protecting bags from damage and keeping them in use will be a major contribution to the defense effort.

Mathieson to Show

High Analysis Pellets

High analysis pelletized fertilizers will be exhibited at two state fairs by Mathieson Chemical Corp. The company will show 16-20-0, 13-39-0, 10-30-10, 12-12-12, and 12-24-12 grades at the Oklahoma State Fair in Oklahoma City, September 22-29.

At the Missouri State Fair in Sedalia, October 18-26, the company will display, in addition to the above grades, samples of 11-48-0 and 6-24-24.

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V-C fibers
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Fluosilicates Salt Cake
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Barrett Div., Allied Chemical & Dye Corp., New York City
Commercial Solvents Corp., New York City
Lion Oil Co., El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE

Lion Oil Co., El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

BAG MANUFACTURERS—Burlap

Bemis Bros. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Cotton

Bemis Bro. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Paper

Bemis Bro. Bag Co., St. Louis, Mo.
International Paper Co., Bagpak Div., New York City
Hammond Bag & Paper Co., Wellsburg, W. Va.
Jaite Company, The, Jaite, Ohio
Kraft Bag Corporation, New York City
Mente & Co., Inc., New Orleans, La.
Raymond Bag Co., Middletown, Ohio
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Dealers and Brokers

Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES

International Paper Co., Bagpak Div., New York City

BAG PRINTING MACHINES

Schmutz Mfg., Louisville, Ky.

BAGGING MACHINES—For Filling Sacks

Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

BONE PRODUCTS—Bone Black

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID

American Potash and Chem. Corp., New York City

BROKERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—For Holsts, Cranes, etc.

Hayward Company, The, New York City

BUCKETS—Elevator

Baughman Manufacturing Co., Jerseyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

CARS AND CART

Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

CASTOR POMACE

McIver & Son, Alex. M., Charleston, S. C.

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Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Div., Allied Chemical & Dye Corp., New York City
Commercial Solvents Corp., New York City
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
Lion Oil Company, El Dorado, Ark.

Koppers Company, Inc., Tar Products Div., Pittsburgh, Pa.

McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.
United States Steel Corp., New York City
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

CHEMISTS AND ASSAYERS

Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CONDITIONERS

Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio
Quakers Oats Company, Chicago, Ill.

COTTONSEED PRODUCTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.

DRYERS

Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial

Chemical Construction Corp., New York City
Fairlie, Inc., Andrew M., New York City
Marietta Concrete Corporation, Marietta, Ohio
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Titelstad Corporation, Nicolay, New York City

FERTILIZER (Mixed) MANUFACTURERS

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

FISH SCRAP AND OIL

Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

HOPPERS

Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

IMPORTERS, EXPORTERS

Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES

American Agricultural Chemical Co., New York City
Andrews Sales, Inc., W. R. E., Philadelphia, Pa.
Kolker Chemical Works, Newark, N. J.

LIMESTONE

American Agricultural Chemical Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

LOADERS—Car and Wagon

Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling

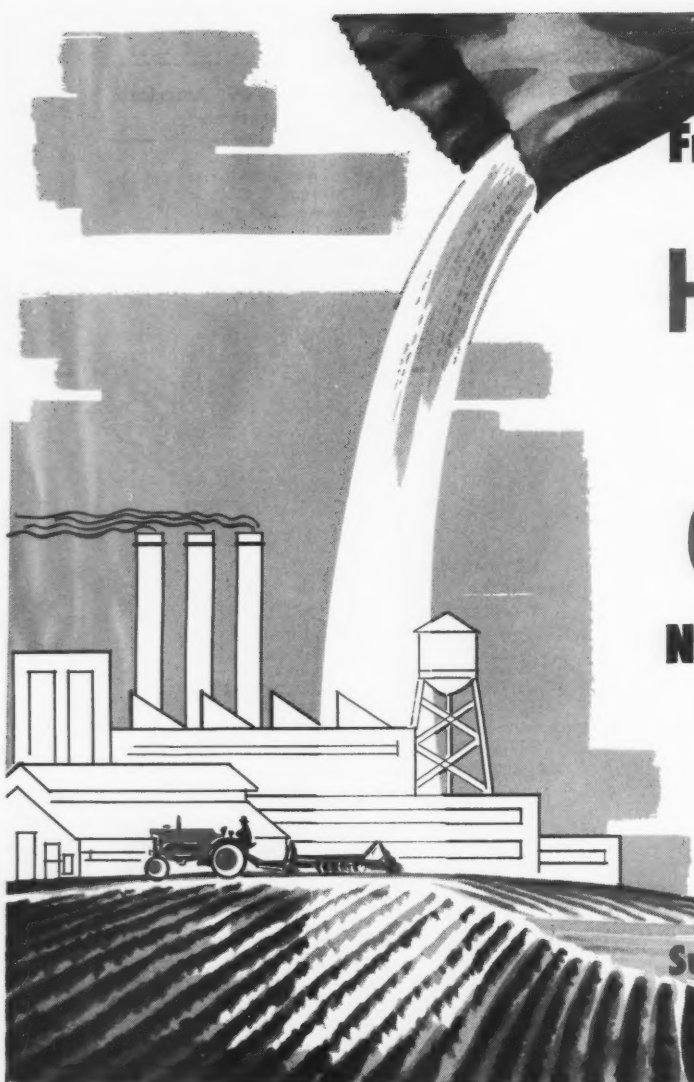
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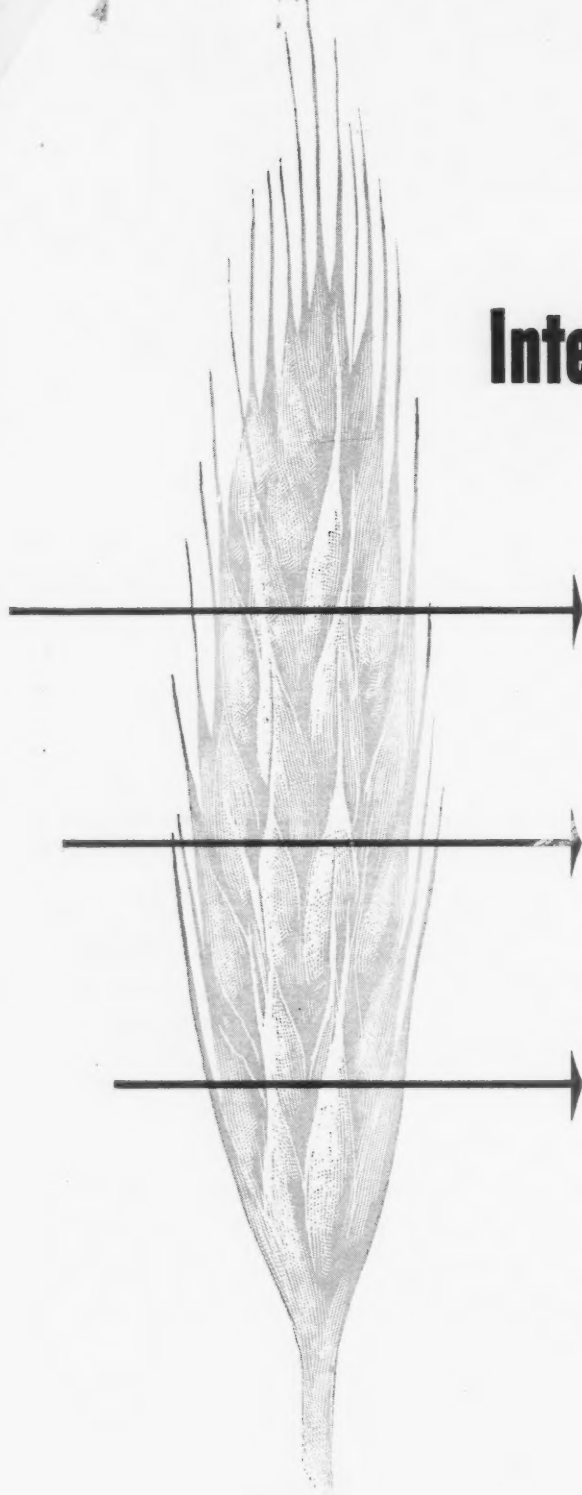
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